Statewide Advanced Traveler Information System (ATIS)

FL-ATIS System Design Document

Prepared for the Florida Department of Transportation

Version 1.5

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FL-ATIS System Design Document

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Document Control

Table 1: Document Control

Client:	**Florida Department of Transportation**
Project Name	Florida Advanced Traveler Information System
Report Title	FLATIS System Design Document
IBI Reference	15422
Version	1.6
Digital Master	[File Location]
Originator	[Geoff Carter, Margot Danard, Frank Ullrich, James Barbosa, Rick Yeung, Brian Chong, Ata Haq, Jens Bergen, Ron Mains]
Reviewer	[Ron Mains, James Barbosa Olga Sanchez]
Authorization	[Ron Mains, James Barbosa]
Circulation List	Gene Glotzbach, Erik Gaarder, Hong-Ting Chen
History	30July2008 – V1.3 – Final review, edits, and approval. 14August2008 – V1.4 – RTM updated with IVR SW Module ID 04September2008-V1.5- Design Requirements for IVR

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1 Introduction

1.1 Purpose

This document serves as a blueprint for the implementation of Florida's Statewide Advanced Traveler Information System (FLATIS).

The purpose of this document is to:

- Describe the design of FLATIS
- Specify design requirements for FLATIS
- Identify the architecture of FLATIS

The functionality is derived from Exhibit A of ITN-DOT-06/07-9053-JP, and the requirements traceability matrix in section 5 which should be considered a companion document to this SDD, and is often referred to.

Although Data Fusion Subsystem has not been covered in this document, it is an integral part of Florida's Statewide Advanced Traveler Information System; a description of its design can be found in the SunGuide Release 4.0 Software Design Document (note that this document does not exist yet). Refer to SwRI DFS (SunGuide R 4.0) System Design Document for details on DFS.

Much of this SDD is intended to be comprehensible by operations staff, who may review this document to ensure that FLATIS will meet their operational needs.

1.2 Scope

This document covers the design components for the 5 year duration of the FLATIS project. This document focuses on describing the design of the following FLATIS components:

- Information Dissemination Subsystem
    - IVR Component
    - Website Component
    - Personalization Component
    - Database Component
    - C2C Plug-in
- Quality Management Subsystem
- Video Aggregation Subsystem(VAS)

The document has been organized into Subsystem components. Subsequent sections provide a high level overview of each subsystem.

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1.3 Acronyms and Abbreviations

The following terms are used throughout the document and are presented here for clarity.

Table 2: Acronyms and Abbreviations

Term	Description
ADA	Americans with Disabilities Act
AJAX	Asynchronous JavaScript and XML
API	Application programming Interface
ASR	Automatic Speech Recognition
ATIS	Advanced Traveler Information System
C2C	Center to Center
CCTV	Closed-circuit Television
CMS	Content Management System
CPU	Central Processing Unit
CSS	Cascading Style Sheets
DAL	Data Access Layer
DFS	Data Fusion Subsystem
DMS	Dynamic Message Sign
DTMF	Dual Tone Multi-Frequency: Commonly known is touch tone. A type of switched access line address signaling that uses two tones transmitted simultaneously to indicate a digit (0 to 9) or character (* or #).
EJB	Enterprise JavaBeans
EJBQL	Enterprise JavaBeans Query Language
ESS	Environmental Sensor Station
FDOT	Florida Department Of Transportation
FL-ATIS	Florida Advanced Traveler Information System
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
IDS	Information Dissemination Subsystem
IG	Info Gate. Part of VoxLinx Core.
IVR	Interactive Voice Response
JNDI	Java Naming and Directory Interface
JSP	Java Server Page
LT	LogicTree Corporation.
MRCP	Media Resource Control Protocol
PDA	Personal Digital Assistant
QMS	Quality Management Subsystem
SAE	Society of Automotive Engineers
SDD	System Design Document

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SG	Speech Gate. Part of VoxLinx Core.
SMS	Short Message Service: a communications protocol allowing the interchange of short text messages between mobile telephoned devices.
SRGS	Speech Recognition Grammar Specification. W3C Standard for defining voice recognition grammars.
SSML	Speech Synthesis Markup Language
SVG	Scalable Vector Graphics
TMDD	Traffic Management Data Dictionary
TTS	Text to Speech
VAS	Video Aggregation Subsystem
VML	Vector Markup Language
VXML	Voice XML. W3C Standard for Voice applications.
XML	Extensible Markup Language

2 References

State of Florida, Department of Transportation, Exhibit A, Engineering Scope of Services for the Statewide Traveler Information System (ATIS), ITN-DOT-06/07-9053-JP. Note that this exhibit was not explicitly dated or versioned.

3 FLATIS

3.1 System Overview

The Statewide 511 system consists of two major subsystems: the data fusion subsystem that is being provided by FDOT which will be located in each district, and the Information Dissemination Subsystem being designed and developed by LogicTree and IBI Group.

The Statewide 511 systems main component is the Information Dissemination Subsystem. The IDS contains the following sub components:

- Website Component
- IVR Component
- Database Component
- Personalization Component
- C2C Plug-in

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The following diagram illustrates the High Level architecture of the Information Dissemination Subsystem:

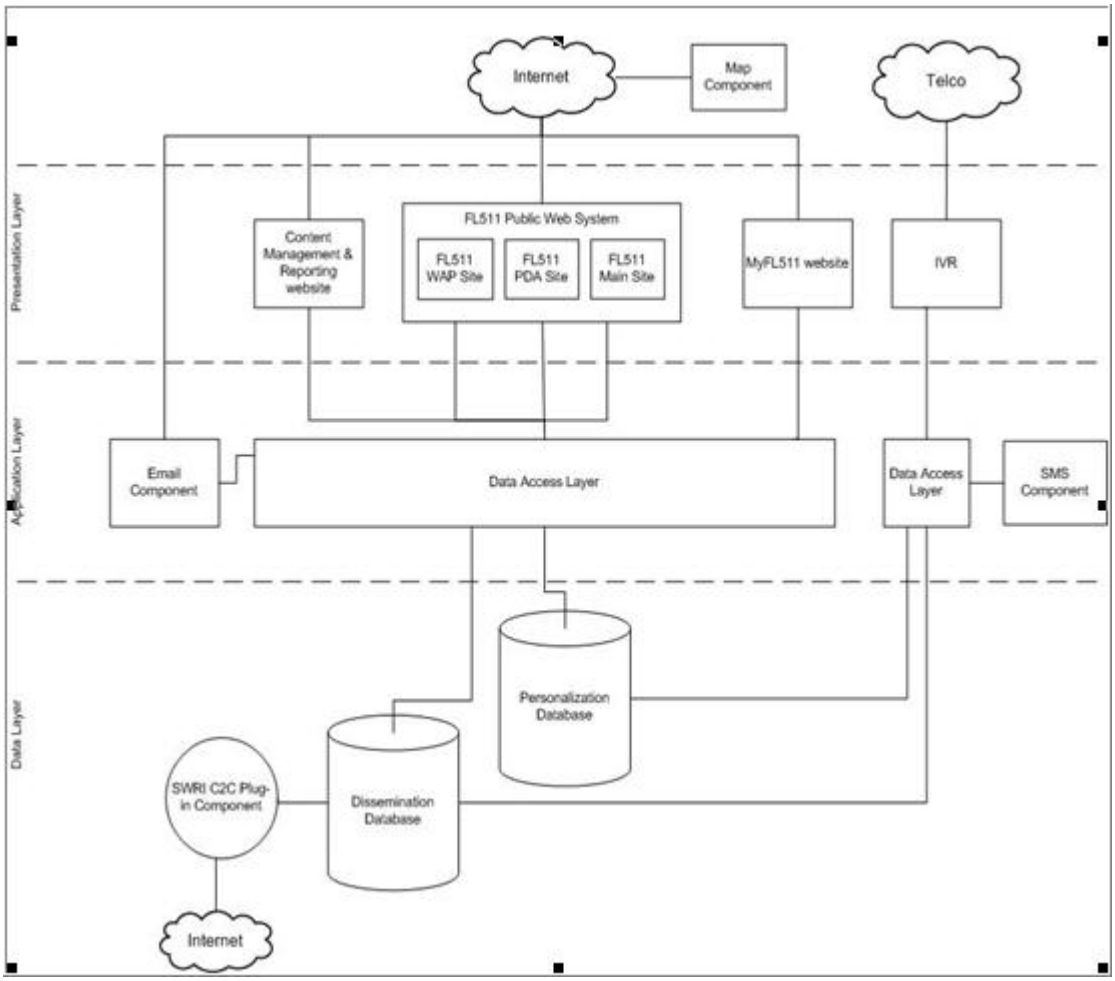

Figure 1: FLATIS IDS Overview Architecture

In addition to the IDS, FLATIS consists of three minor subsystems, including the Video Aggregation Subsystem (VAS), the Weather Information Subsystem, and the Quality Management Subsystem (QMS).

The Database Access layer is where all of the business logic resides. This logic retrieves and processes data from the database and makes it available for the presentation later. Please refer to Figure 12 for all object components of the Data Access Layer

3.2 System Architecture

Figure **2** provides an overview of the proposed hardware architecture that will be hosted at the FLATIS Data Center. Each hardware element is described below and is covered in greater detail in the Subsystem design sections.

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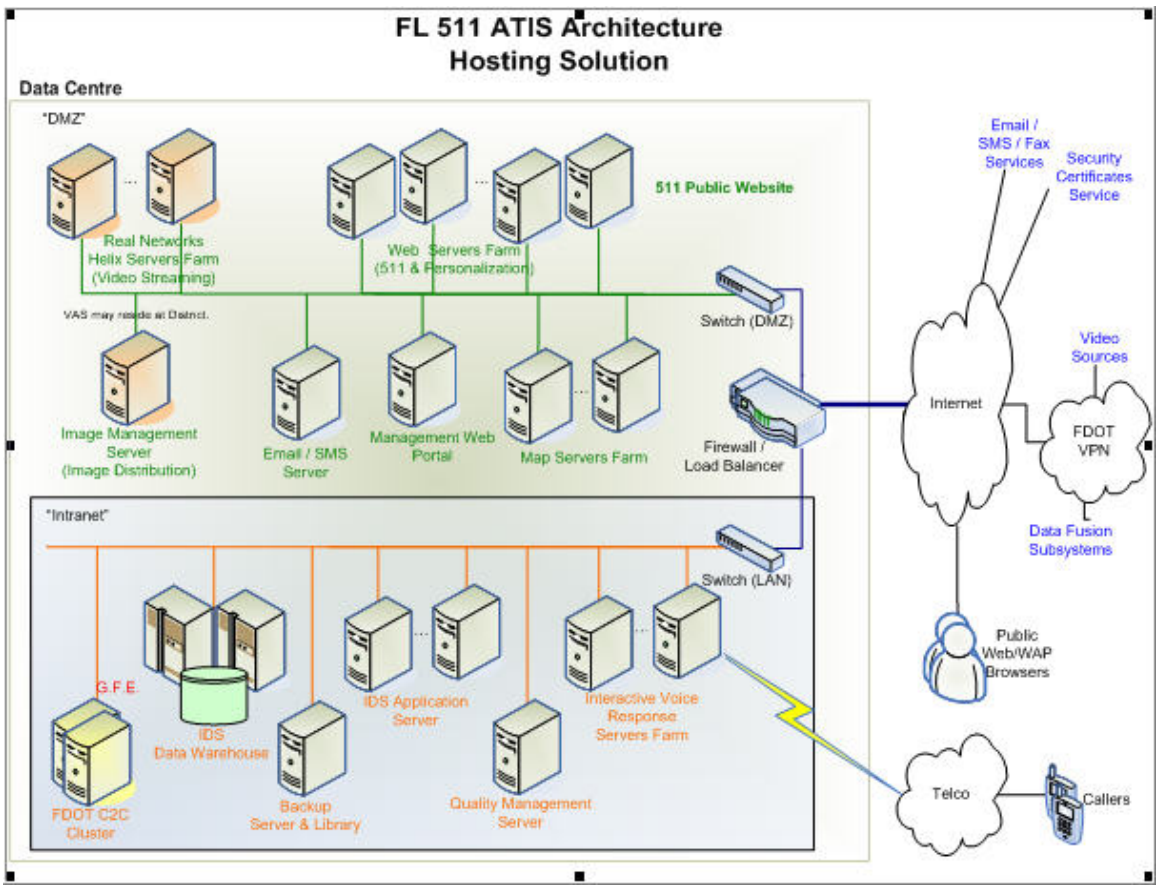

Figure 2: Hardware Architecture

The 511 system will have the following servers:

3.2.1 Web Servers

The 511 system will include web servers configured in a load-balanced cluster farm. Web servers will accept incoming website requests from the Internet and will communicate with the application layer to retrieve data and format it for display on the website.

Load balancing for the web servers will be handled by Microsoft's Network Load Balancing, which is included with Windows Server 2003. To set up Network Load Balancing, each server in a Load Balancing Cluster is configured with a 'virtual' IP address. This IP address is configured on all the servers that are participating in the load balancing 'cluster' (not related to the Microsoft Cluster Service). Whenever a request is made on this virtual IP a network driver on each of these machines intercepts the request for the IP address and re-routes the request to one of the machines in the Load Balancing Cluster based on rules that can be configured for each of the servers in the cluster. This approach inherently supports failover, as a server that fails or loses its network connection will no longer have requests forwarded to it, and the load will be accommodated by the remaining servers.

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3.2.2 Application Servers

The system will consist of application servers, which will receive requests for data from the web servers, retrieve the data from the Application / Data Access Layer, process it, and forward it to the web servers for display on the website. All communication with the database servers will go through the application layer (the web servers will not communication directly with the database).

3.2.3 Database Servers

The system will consist of fault redundant database servers that will retrieve data from the data warehouse and provide it to the application layer for processing. These servers will be configured in a failover cluster using Microsoft Cluster Service.

3.2.4 IVR Servers

This system consists of multiple voice application and speech processing servers and their related telephony interface boards. Incoming telephone calls are first processed by the telephony boards, which then hand the call to the SpeechGate and InfoGate servers which process the actual FL-ATIS IVR application.

3.2.5 Backup Server

The backup server will be a standalone storage device for archiving historical data from the IDS Data Warehouse.

3.2.6 Quality Management Subsystem Server

The QMS server will consist of a single server responsible for monitoring the health of the FLATIS IDS subsystems.

3.2.7 Real Network Helix Servers

The Real Network Helix Servers will consist of 1 server to receive MPEG 2 and MPEG 4 video streams from the districts.

3.2.8 Image Management Server

The image management server will consist of a single server, which will receive CCTV images from the district image servers.

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3.3 Data Design

The FL-511 IDS will have a centralized Data warehouse that will be populated with district data via the C2C Plug-in component. The complete FLATIS database schema is defined in the Appendix, Section **1**. The IDS Data warehouse is responsible for the following:

- Storing all data received from SunGuide via the C2C Plugin
- Storing all IDS configuration parameters entered through the administrative portal
- Storing user profiles entered through the personalization portal

The following diagram illustrates the overall FL-511 data flow between the C2C Plug-in component, the IDS Data Warehouse, and the public interfaces.

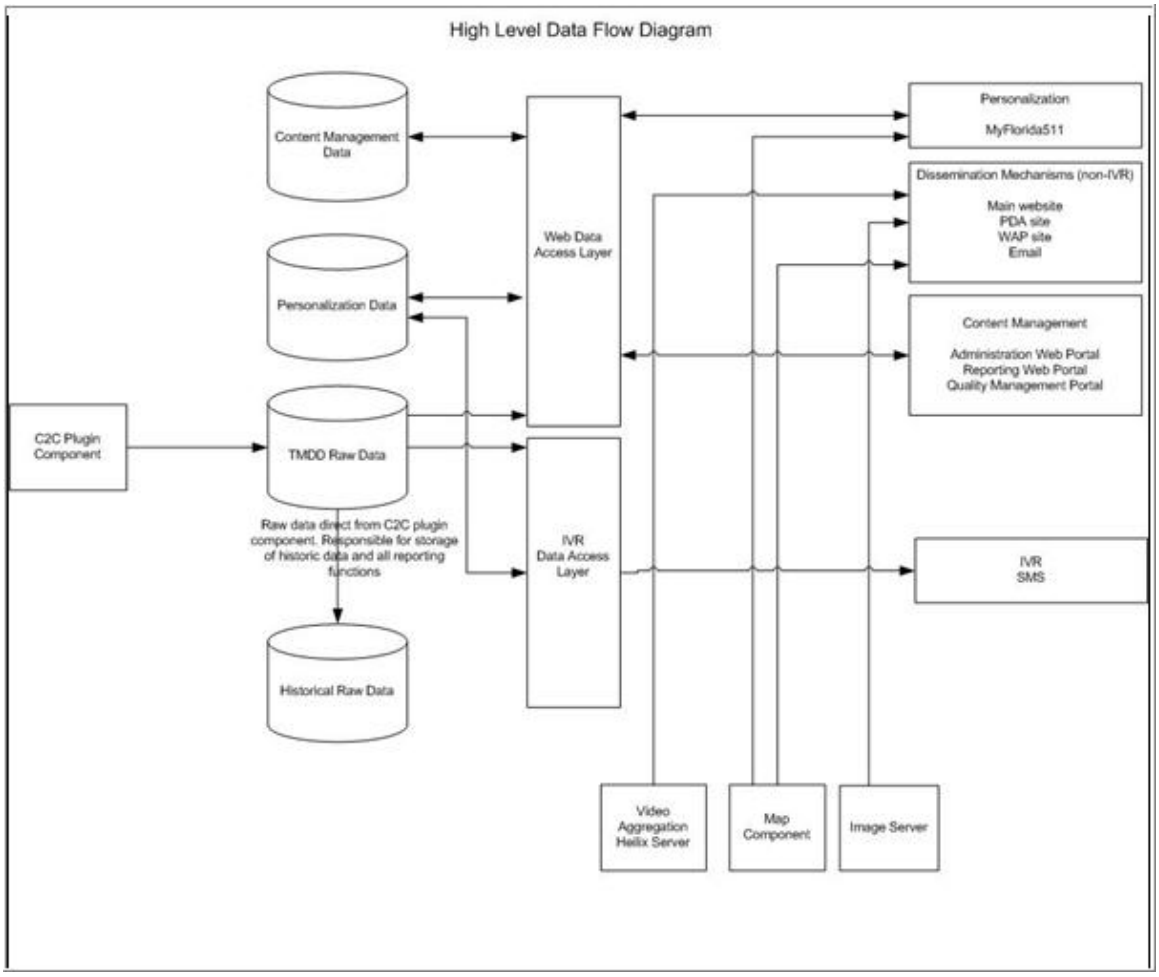

Figure 3: 511 IDS Data Flow

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4 IDS Subsystem – WEB

4.1 Constraints

The following have been identified as possible operational/design constraints to the web subsystem design:

- The web component utilizes a third-party map service and hence, maps availability and functionality such as zooming and panning are limited to what the map provides at that time. Refer section 4.3.2.3.2 for more details on map components.
- The fully featured version of the website has been designed to support 2000 concurrent users. Although the website will support more than 2000 concurrent users, when the number of concurrent users exceeds 2000, the website will automatically switch to text-only mode; the map functionality will be disabled and all images will be removed. Refer to section **Text Only Mode** for details. The requirement to support 2000 concurrent users was derived from 'Florida Answers to QA (62162_ITNDOT06079053JP_1_01)'. This document contains FDOT's response to IBI Group and LogicTree question 17, which references ID011.
- 2000 Concurrent users are based on the answers to QA (62162_ITNDOT06079053JP_1_01) and not the requirement of 25 million users in the first year. Based on 25 million users in one year the website would only have to support 2854 users/hour and 47 users/minute and 12 users per 15 seconds.
- IBI will reference Florida Answers to QA (62162_ITNDOT06079053JP_1_01).
- Data Integrity – Quality of the data will be dependent on data being provided by Data Fusion Subsystem (DFS).

4.2 Information Dissemination Subsystem Web Component Overview

This section outlines all features of the public website including the public accessible traveler information website, the personalization component of My FL511, the mobile version of the website, and the administrative portal.

The web component of the IDS is responsible for disseminating information to the public via two websites; the main website, which presents some information graphically, and a mobile website (which would be used by Personal Digital Assistants and Phones with Internet Access), which presents information using only text. Both the main and mobile websites shall employ a multi-tier architecture, where the Application / Data Access Layer are cached to improve performance.

4.3 Information Dissemination Subsystem Component Architecture

4.3.1 Design Rationale

To meet the web architecture requirements a three tier scalable solution is proposed. The design rationale for the selection of this architecture is presented below. The proposed choice of technology is presented in section 4.3.2 .

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4.3.1.1 *What is a multi-tier architecture?*

A multi-tier architecture (often referred to as n-tier architecture) is a client-server architecture in which an application is executed by more than one distinct software agent. For example, an application that uses middleware to service data requests between a user and a database employs multi-tier architecture. The most widespread use of "multi-tier architecture" refers to three-tier architecture. The diagram below illustrates the conceptual design of three-tier architecture.

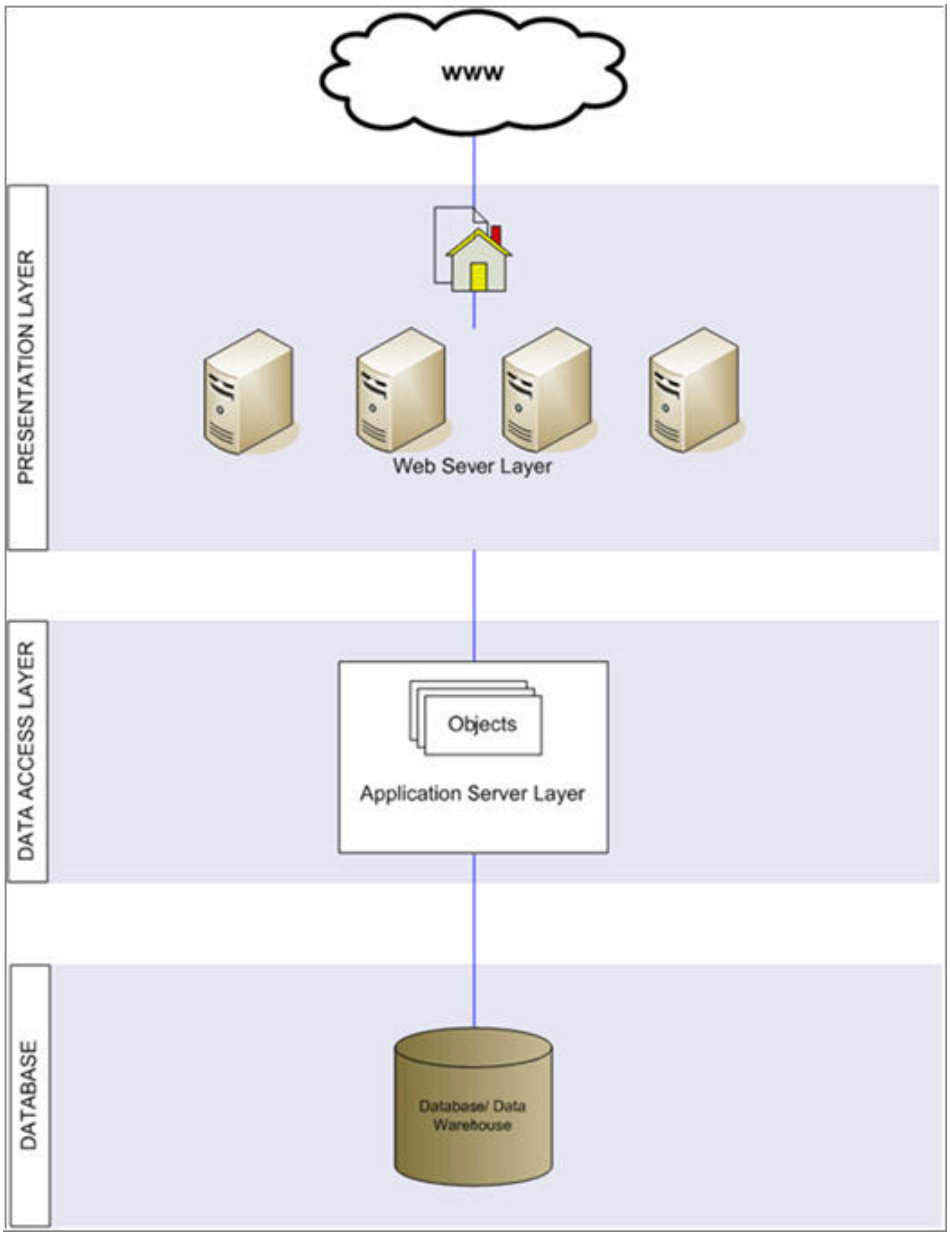

Figure 4: Three Tier Conceptual Architecture

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'Three-tier' architectures normally employ a client-server architecture in which the user interface (Presentation Layer), functional process logic or data processing rules (Application / Data Access Layer), computer data storage (Data / Database Layer) are developed and maintained as independent modules, often on separate platforms.

Three-tier architectures are used to support design for high availability and high performance Web systems, which are built using three conceptual layers. These layers include:

- A front-end Web server serving static content
- A middle dynamic content processing and generation level Application server.
- A back-end Database or data store, which includes a relational database that provides access to the data.

4.3.1.2 Why employ a multi-tier architecture?

The key advantages of a multi-tier architecture are:

- Levels of abstraction
- Performance
- Scalability
- Maintainability

4.3.1.2.1 Levels of abstraction

In design, the high-level system abstraction is based on data processing rules and not on front-end or back-end technologies. The Application Layer processes Database data according to these data processing rules, and the output of the Application Layer feeds the Presentation Layer.

The tiers are to be populated with functionality in such a way as to minimize dependencies, and isolate functionalities in a coherent manner – accommodating change, and changes should be made in the fewest number of places, and be independently testable. This level of abstraction also supports the parallel development of the presentation and database layers.

4.3.1.2.2 Performance

Along with the web servers, the next logical back-end capacity constraint in web architecture is often the delivery of dynamic content from the database. Legacy systems using simple web-to-database connectivity architectures are created without any level of abstraction between data and the web pages. Essentially, the number of connections and therefore load on the database will be dependent upon the number of web users. An Application Layer removes this dependency placing the load on the web servers – performance can then focus on the presentation layer delivery and this network zone.

An Application Layer provides a level of abstraction and the ability to pool connections to the database thereby negating potential capacity constraints of the database, as data access components are stored in memory and access to the database is limited. The Application Layer offers a higher level of system capacity and functionality, especially as

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control layers are stored in configuration files. For example, a table of events web page display properties is defined by a configuration file making display changes relatively easy.

Application servers offer further levels of abstraction within multi-tier architectures such that application components can be distributed across multiple physical clustered application servers. This allows the complete separation of web presentation layer from application layer from database layer. This architecture is employed in high-end, mission critical systems, such as Internet banking applications.

As noted, the performance of the system is then focused on the use of relatively inexpensive web servers, which can be added to the presentation layer when required. Typically, technologies and network architectures will support the addition of up to 24 web servers in a single instance of web system. The greater the number of web servers the greater resilience, reliability, and performance.

Initially, there will be a total of five load balanced web servers hosting FLATIS websites. This will support a minimum of 2000 concurrent users with a refresh time of less than one second. This solution is scalable, allowing for the addition of web servers as needed. As user demand increases server loading, additional servers will be added to the web server farm to support future needs.

4.3.1.2.3 Scalability

Application servers often support clustering for purposes of load-balancing and fail-over control. As noted, the performance of the system is then focused on further use of web servers. Three-tier architecture supports the expansion of the web layer easily.

The implementation of an Application Layer can be used to separate the application logic and the object publisher/editor components through an abstraction layer. With the use of this architecture, it will be possible to quickly migrate between Application Layer implementations. In other words, the architecture is very modular, allowing the Data Access Layer (DAL) to be replaced without affecting the other layers. This is beneficial, because a more efficient DAL technology may become available in the future, the use of which may result in supporting additional concurrent users, without having to modify other layers.

4.3.1.2.4 Maintainability

Maintenance normally covers patching, upgrades, updates or bug fixes to applications, software or hardware. The proposed three-tier architecture minimizes the downtime associated with maintenance. This level of abstraction allows for the live testing and replacement of various layer components, resulting in the minimization of software defects, and a high level of availability.

4.3.2 Architectural Design

The Website Component will follow a multi-tier architecture and be designed using a 3-tier pattern as discussed in section 4.3.1. Each tier or layer is responsible for different logical elements of the system and will contain one or more software components or modules, which interact via well-defined interfaces. Modules and components within each layer are developed and maintained independently, and deployed across different platforms.

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As outlined in section 4.3.1, multi-tier web system architecture will consist of three main layers that include:

- Data Layer - Responsible for data storage and retrieval from file or database.
- Application Layer - Responsible for data movement between other layers. Performs business and logic functions required to translate data required by other layers.
- Presentation Layer - Responsible for providing User Interface. Presents data in a format, which a user can understand, and handles user interaction.

Sections 4.3.2.1 and 4.3.3 detail the implementation of the data layer and physical architecture for the implementation of this design.

NCACHE approach is proposed to be used. The fact that one is designing a sophisticated demanding system that is required to meet high performance requirements dictates that a proven solution should be adopted. FLATIS is a sophisticated system because it must efficiently and effectively disseminate information to very many users; FLATIS will be one of the largest ATIS systems in the country, and will collect data from a significant number of sources (9+ different sources initially).

Not only does the system require a reliable Application Layer, which will be provided by NCACHE, but there is also a requirement for a centralized point to deploy the system logic. This will take the load off of the database layer limiting the number of transaction on the database. The clustered web server environment has to meet “high availability” requirements, which can be supported by an application server.

With an application server it is possible to deploy the following functionality:

- Business Logic
- Centralized application logic units, decision processes and calculation algorithms
- System messaging and events
- E-Mail and Text services that re-use the same component infrastructure available to web applications
- Synchronization with external resources such as remote information systems by web services or other protocols
- Exposing the system’s own resources to external clients
- The capability of using the same logic from independent applications if there is a requirement in the future
- Off the shelf frameworks for retrieving and persisting data components
- Clustering capabilities providing a performance boost and redundancy, yet still providing a centralised point for the system’s functionality and distributed caching of data components

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The following diagram illustrates the high level architecture for the IDS- web subsystem using the three tier approach.

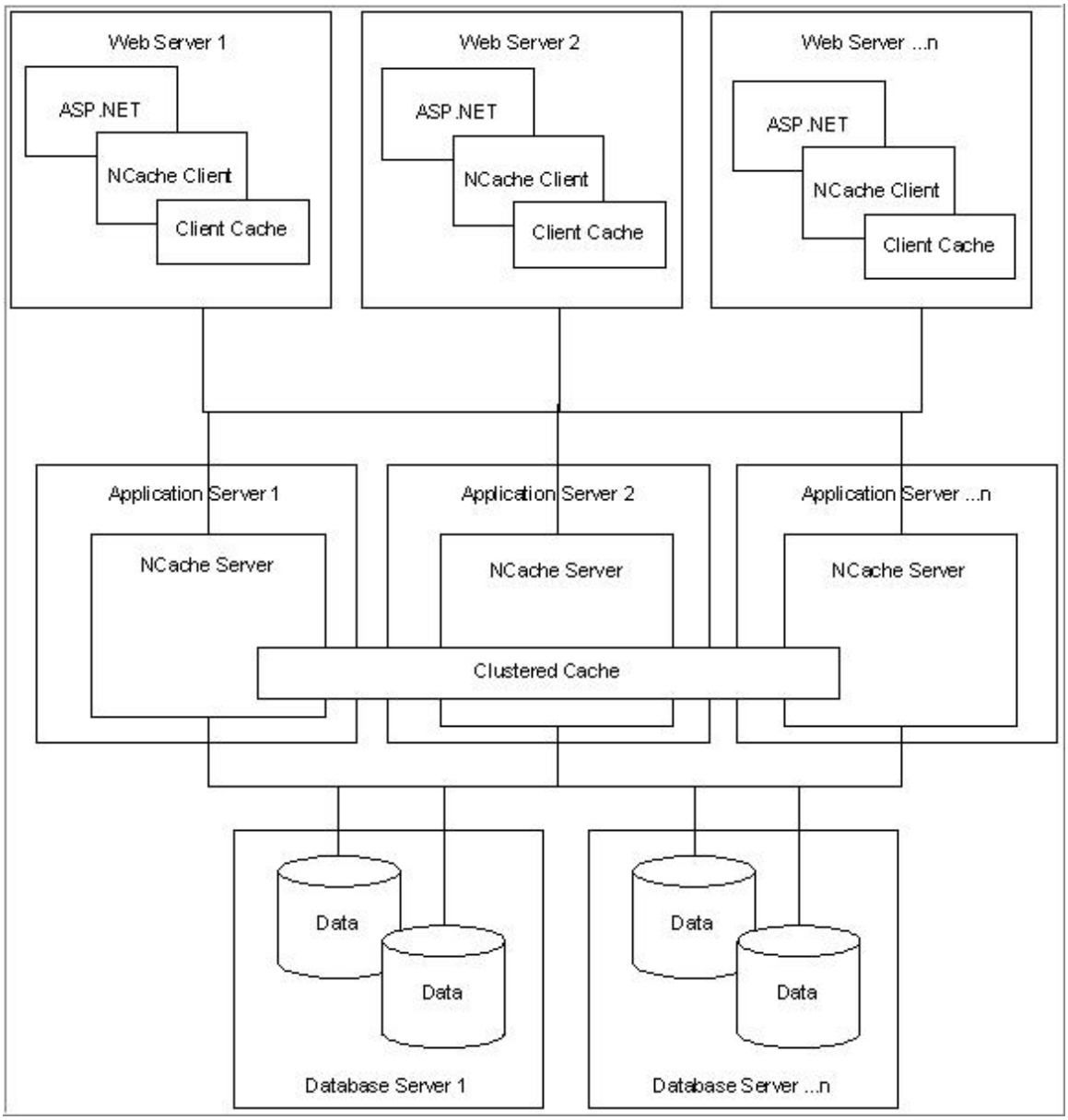

Figure 5: High Level Physical Architecture Web

4.3.2.1 Data Layer

The Data Layer is a specific abstraction within a three-tiered architecture. Its foundation is essential for the other tiers to be able to function as required and as such, it must be fleshed-out at a logical, abstracted level that is concerned mainly with describing the data structures and the interaction between them. In the context of this design document, this is represented by meta-data presented in a commentary, a logical data model, and a series of data flow diagrams that describe the flow of data between entities. Metadata is information or data about data. Metadata are used to facilitate the understanding, characteristics, and management usage of data.

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4.3.2.1.1 Database Components

The Website Component will be driven by a dedicated database containing three main datasets:

- Personalization dataset
- Administrative/Content Management dataset
- Traffic Information dataset

The three datasets will be combined into a single database to allow efficient and consistent data access for the Website Component. A single point of access for data will help ensure stability and make the component easier to develop and maintain. An efficient web database is essential to guarantee performance and stability of the web component; the database will therefore only contain the current information available for each dataset. Only data essential for dissemination via the web component will be stored in the web database. Storage of historical data and non-dissemination data will be handled by the IDS Database Component.

4.3.2.2 Application Layer

4.3.2.2.1 How it Works

The second tier of the Website Component architecture is the Application Layer. The Application Layer is responsible for data movement between other layers. It performs business and logic functions required to translate data required by other layers.

Multiple web servers, which connect to an Application Server cluster for all data related operations. Application Servers have a unique cluster-wide distributed cache for caching objects already retrieved from the database.

4.3.2.2.2 Data Access

The Application Layer provides simplified access to data stored in the database and handles the caching of data. All data required by the Presentation Layer will be cached. Each server shall possess sufficient RAM, based on preliminary benchmark testing. RAM will be added as required.

NCache will be used to cache entity objects and provide clustered ASP.NET sessions for the server farm. NCache is a distributed in-memory object cache for mission critical applications.

Using NCache's Object Query Language (OQL), which is similar to SQL, it is possible to create high-performance queries on indexed object properties.

An ASP.NET page can retrieve data by calling the IBLL interface, which calls the relevant class in the DAL layer to return the cached object if it is already loaded, otherwise, the object will be loaded from the database and cached.

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4.3.2.2.3 Email Component

Considering the computer processing power required to generate the personalized traffic alert messages for a large number of subscribers and to ensure the subscribers alerts delivery time is met, a divide and conquer approach has been undertaken.

The email component will be specifically designed on Alchemi.NET, a grid computing framework to aggregate the computing power of the application servers into a computational grid supercomputer.

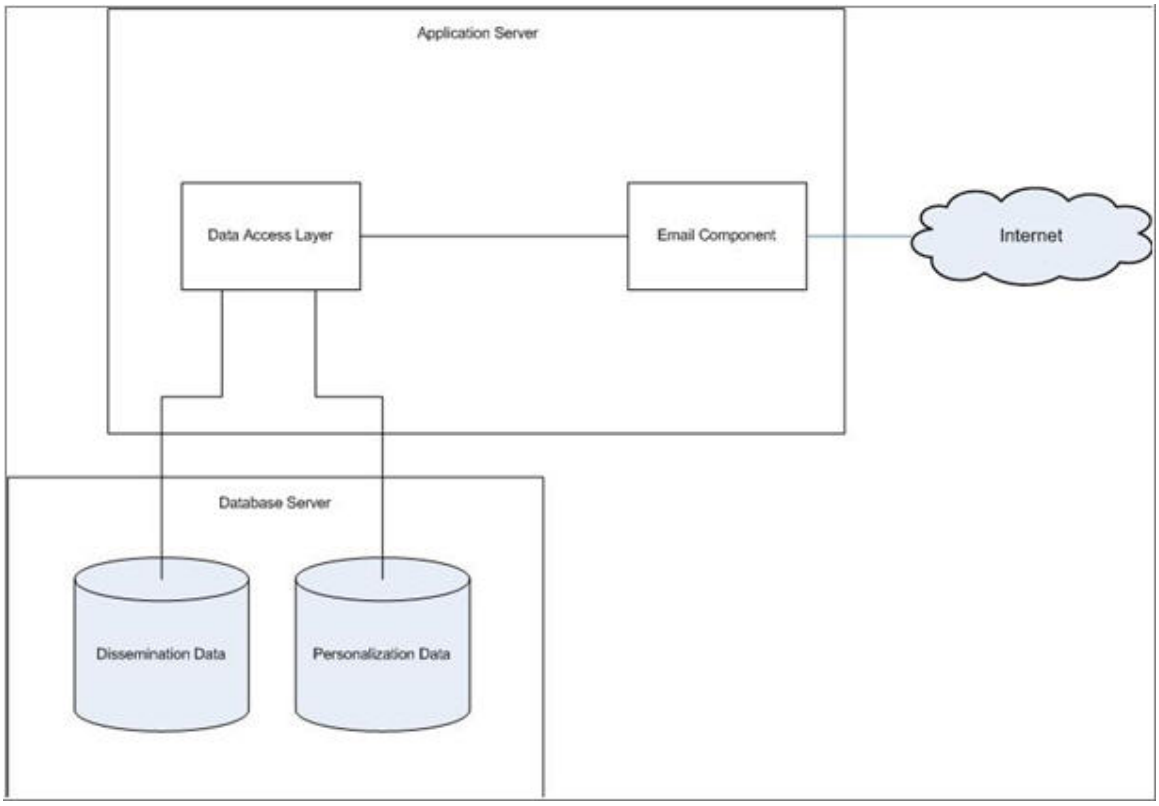

Figure 6: E-mail Component Conceptual Architecture

The email component will maintain a list of ongoing traffic events. A terminated event will reside in the list until all subscribers are notified of the termination, and then it will be deleted.

There will also be a list of subscribers currently enabled to receive alerts and their preferred time slots. Note that the time slots used by the system are in 15 minutes intervals of an hour, for example 9:00am, 9:15am, 9:30am, 9:45am, etc. This list will also include personalized alerts message already delivered to the subscriber.

A distributed batch process residing on the application servers will be scheduled to run at 15 minutes intervals to generate personalized traffic alert messages. The batch process will be run 10 minutes prior to each available 15 minute interval time slot of the above-mentioned, for example 8:50am, 9:05am, 9:20am, 9:35am, etc.

This will generate the alert messages particular for ongoing and scheduled events ahead of the subscribers defined time slots and have not yet been delivered to the subscriber so that valuable computer processing power will be available for new events.

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On the other hand, personalized alert messages of new events will be generated on demand and scheduled to be delivered at the subscriber's defined time.

The application will have access to several template formats, thus making it easy to personalize text in the messages. Templates will be available in English and Spanish and the email delivery component will have to determine which language to use based on user profiles.

Template files would just be plain text or html template files containing keywords that must be replaced with personalized parameters like name, accident information, and so on.

Alert messages will also be consolidated whenever two or more messages are to be delivered at the same time to the subscribers.

Email messages will be delivered with a distributed SMTP delivery application that is specifically designed to send outbound email messages directly without a relay mail server.

4.3.2.3 Presentation Layer

4.3.2.3.1 Overview

The Website Component presentation layer is responsible for providing the User Interface. The presentation layer contains a number of components, which facilitate the display of information in the form of web pages. These include:

- Map Component
- 511 Main Website
- 511 Mobile Device Websites

These components use a combination of technologies to deliver data obtained from the Application Layer –and present the data in a format, which a user can understand. It also handles user interaction.

4.3.2.3.2 Map Component

Dynamic mapping functionality for the web site shall be provided by embedded Google maps.

Google Maps has been chosen as the map service provider as it is widely known and accepted on the web. Google Maps also offers the following benefits:

- Proven
- Efficient
- Dependable

Google Maps uses JavaScript extensively. As the user drags the map, the grid squares are downloaded from the server and inserted into the page. The GIS (Geographic Information System) data used in Google Maps are provided by Tele Atlas, NAVTEQ and MAPIT MSC.

Google Maps Application Programmer Interface provides a number of leading cutting-edge utilities for manipulating maps and adding contents to map.

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The two key functionalities that Google Maps offers are content clustering and encoded polylines.

Often more map content may lead to slower map renderings and introduce visual clutter at higher zoom levels. Content clustering addresses this by efficiently grouping content on higher zoom levels and by specifying which zoom levels content should appear.

Traffic speeds are represented on the map using colored line segments, which are described by a series of points. The colored lines will be roadways direction specific. Long and complicated lines (with thousands of points) require a fair amount of memory and often take longer to draw.

Google Map's encoded polylines enables the application to specify groups of zoom levels that should be ignored when drawing line segments and it uses vector drawing capabilities like Scalable Vector Graphics (SVG) and Vector Markup Language (VML) of the client web browser for the optimal performance as opposed to drawing on the server-side.

The diagram below shows the interactions of Web and Map component.

1. The first request originates at the browser (e.g. display events). Using AJAX, the request is sent to the Web component.
2. Server side code (ASP.NET or JSP) processes the request and creates formatted XML (e.g. with all events) with the data indirectly from Database (via the Application Layer) and sends response to client.
3. Response is received by AJAX and parsed with JavaScript. It can then call the Google Maps API for the necessary map renderings.
4. Google Maps API renders the map and sends new images over to the client using AJAX.

AJAX (Asynchronous JavaScript and XML), or Ajax, is a group of inter-related web development techniques used for creating interactive web applications. A primary characteristic is the increased responsiveness and interactivity of web pages achieved by exchanging small amounts of data with the server "behind the scenes" so that entire web pages do not have to be reloaded each time there is a need to fetch data from the server. This is intended to increase the web page's interactivity, speed, functionality and usability. JavaScript is the scripting language in which AJAX function calls are usually made.

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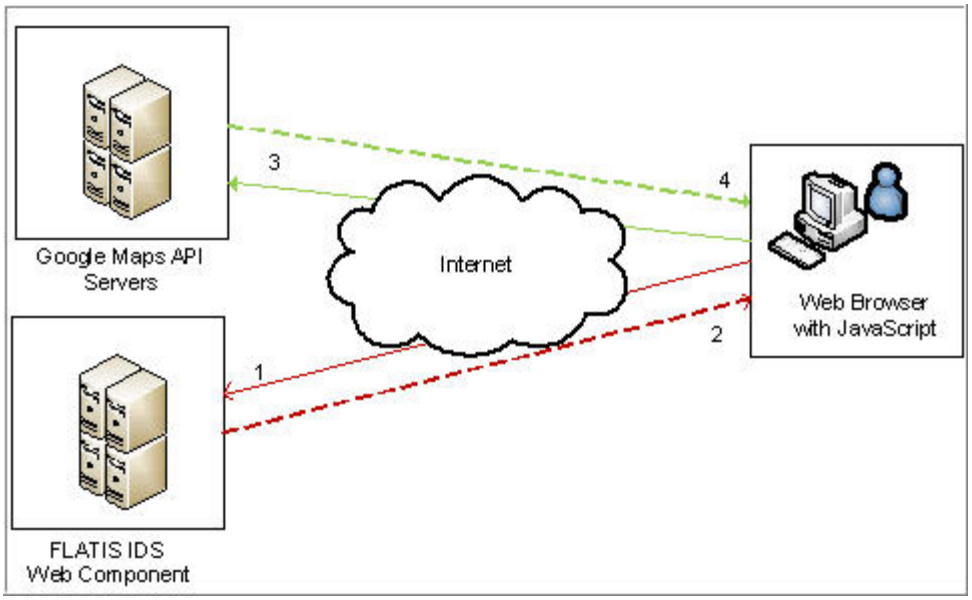

Figure 7: Map Component Interface

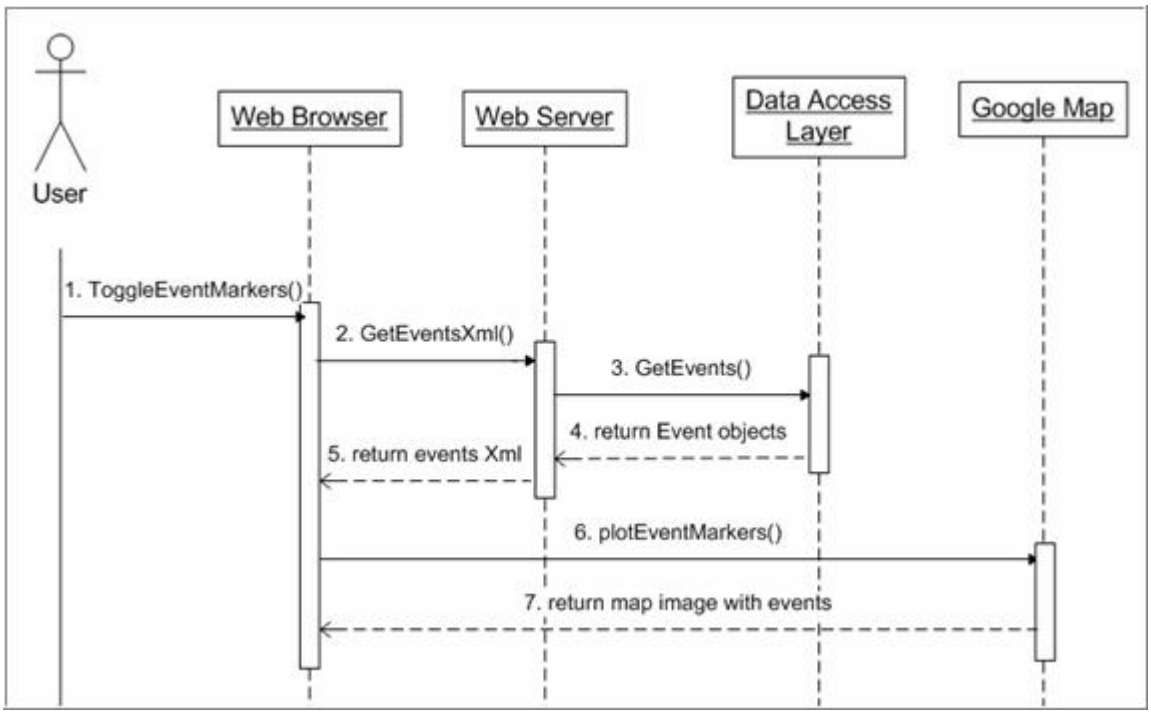

Figure 8: Sequence of interactions between Web Component and Google Map

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User toggles on event traffic information by checking the checkbox on the Map Legend.

1. Web Browser makes an HTTP request to the web server to display event traffic information.
2. Web Server makes a request to the Application Layer to acquire all data associated to event traffic.
3. Application Layer returns a collection of event objects to the web server.
4. Web Server populates a XML file containing a collection of event traffic information.
5. Web browser's java script then parses the XML file and plots the appropriate events on the map by Google Maps API.
6. The Google Map server returns map images with plotted events to the web browser for display.

Users don't have to configure their browsers in any specific way to use the FL-ATIS website, and they do not need to download a specific application to access the website.

4.3.2.3.3 511 Main Website

The 511 main website will be built using ASP.NET web application framework and will deliver a combination of static and dynamic data via web pages. Additional and assistive technologies will be used to deliver and control specific content; these include HTML, CSS, JavaScript, and AJAX.

The 511 main website will have several key elements:

- Dynamic Pages
- Static Pages
- Multi-language Support
- Accessibility
- Text Only Mode

Dynamic Pages

Dynamic pages will display dynamic content, which is continually updated (e.g. traffic event information and warning messages) with a browser side technology (JavaScript) at regular intervals. The dynamic content on the website will be updated at an administrative configured level. The default interval is set to one minute. Users will not be able to define the rate at which the page they are view is updated, however, they can always do refresh of the webpage using the browser refresh button.

Pages will use a combination Map, List views and scrolling banners to present traffic information to the website user. These pages will incorporate several ASP.NET web controls, custom JavaScript controls and Map Components (see above) to access dynamic data from Application Layer.

Java Script scrolling banners spanning across the entire website are used to display floodgates messages according to region selected by the user and shows all state wide

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floodgates by default. Floodgate messages are also presented in List views and can filtered according to region, county, city, roadway and roadway segment.

Static Pages

Static pages will display static content (e.g. site navigation, menus, and site map).

Multi-language Support

The main website must support information delivered in both the English and Spanish languages. The Website Component will be responsible for handling the switching of static web page content between the two available languages. Information and text relating to dynamic traffic event data will be translated before reaching the Presentation Layer. The diagram below shows how multi-language support will be achieved.

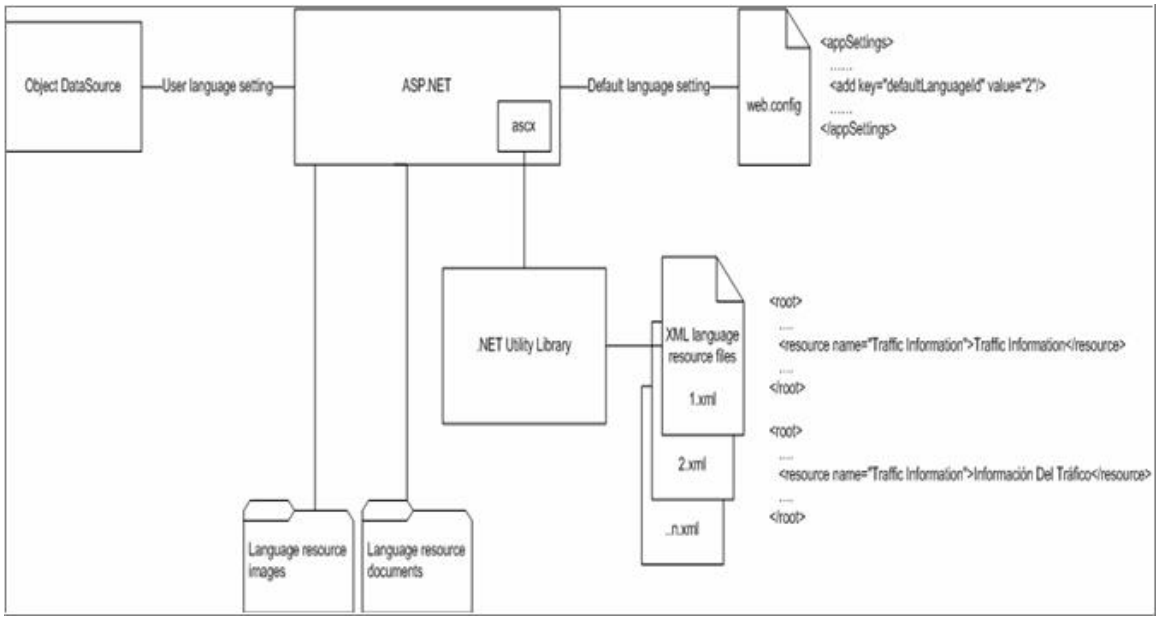

Figure 9: Multi-language Support Architecture

Presentation layer is configured with a series of language dependent elements, including images and help documentation.

Each language is assigned an id (for example, 1, 2, 3, and so on) and an associated resource file is the conf folder (for example, conf\language_id.xml). The Resource file contains a series of language dependent strings and associated translations. Language dependent images are stored in the lngimages folder (e.g. lngimages\language_id\image_name.jpg). Language dependent documentation is stored in the lngdocs folder (e.g. lngdocs\language_id\rm_help.html).

Accessibility

The 511 website must comply with section 508 of the Americans with Disabilities Act. The following outlines the design decisions made in order to comply with this:

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- There are text only pages displaying events, travel time/speeds, DMS and weather data to provide equivalent information as the map.
- All images, image links and image maps have text equivalents.
- Image maps have redundant text links.
- Row and column headers are identified for data tables.
- Data tables with two or more logical levels of row or column headers are marked up to associate data cells and header cells.
- Electronic forms are accessible for input fields and proper tabbing.
- Links are provided for users to skip repetitive negative links.
- There are multiple color coded options for congestion related information.
- Font, font type, font size, and color are defined in external style sheets and all web pages are readable without them.
- No flickering with a frequency greater than 2Hz and lower than 55Hz.
- Pages do not require plug-ins.

Text Only Mode

The main website must be capable of operating in a Text Only Mode, in order to support greater than 2000 concurrent users during periods of unusually high demand. This Text Only Mode will be based on the disabling of Cascading Style Sheets (CSS), Imagery and the Map Component.

The Text Only Mode is designed for both automatic and manual invocation. Text Only Mode may be manually invoked by the main website users or by the system administrator via the xml file configuration. Both the Application and Presentation Layers are involved in the automatic invocation of Text Only Mode. The diagram below demonstrates how the automatic text only mode switching will be achieved.

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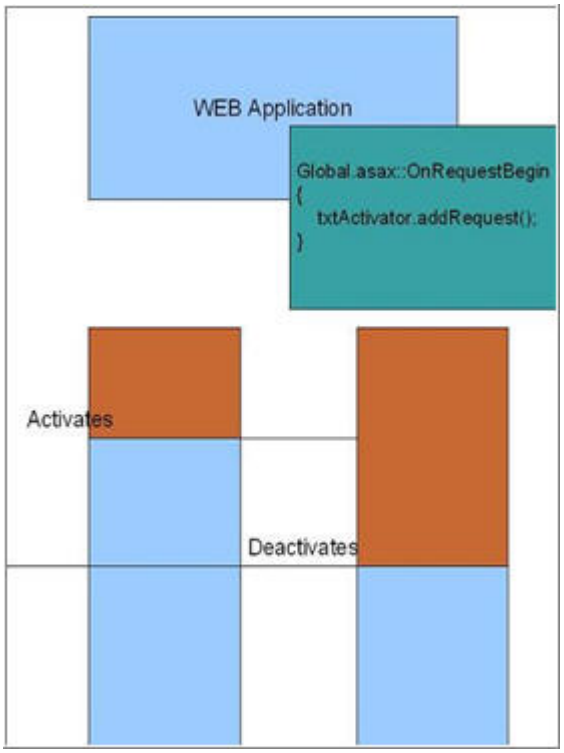

Figure 10: Text Only switch logic

Both the Application and Presentation Layers will monitor the number of concurrent connections (users); when the number of concurrent users exceed a configurable threshold (which shall be greater than 2000), the main website will switch to Text Only Mode.

To determine what this threshold should be, IBI will ascertain how many concurrent users the main website can support while being able to maintain a web page refresh rate of less than 2 seconds. Preliminary testing indicates that IBI should be able to support roughly 5000 concurrent users before having to switch to Text Only Mode.

As Figure 10 depicts, IBI will employ two thresholds; a Text Only Mode Activation threshold (discussed above), and a Text Only Mode Deactivation threshold (which shall also be greater than 2000). The use of a second 'Deactivation' threshold will prevent frequent mode switching.

4.3.2.3.4 Mobile device

There will be a completely separate 'mobile' version of the website for mobile devices. This 'mobile' website will possess limited functionality and will be designed for smaller resolution screens. The 'mobile' website will employ a different URL (www.website-name.com/mobile).

4.3.3 Technologies

This section provides a high level overview of the software and hardware technologies being employed by the Website Component.

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4.3.3.1 Software

This section provides a high level overview of the software technologies being employed by the Website Component.

4.3.3.1.1 Data Layer technologies

This section defines the technologies that will be deployed on the data layer. The Data Layer will consist of a single Oracle relational database instance, which will contain all data required by the subsequent Application and Presentation Layers.

4.3.3.1.2 Application Layer Technologies

This section defines the technologies that will be deployed at the Application Layer. The Application Layer will be built on NCACHE technologies.

Multiple web servers will connect to an NCACHE Application Server cluster for all Application Layer related operations. Application Servers will perform all central or logical processing, including data access, data translation, calculations, messaging, asynchronous resource access, synchronization with external resources, scheduling and communications (email and text messaging).

A replicated cache clustering topology will be employed whereby all data in the cache is replicated on all Application Servers in the cluster. This allows each Application Server to access all data locally, thereby reducing data access latency. Use of the replicated cache clustering topology also provides greater redundancy. If an Application Server were to become unavailable, cache data is not lost – it is provided by the remaining available Application Servers.

The figure below illustrates the replicated cache clustering topology”

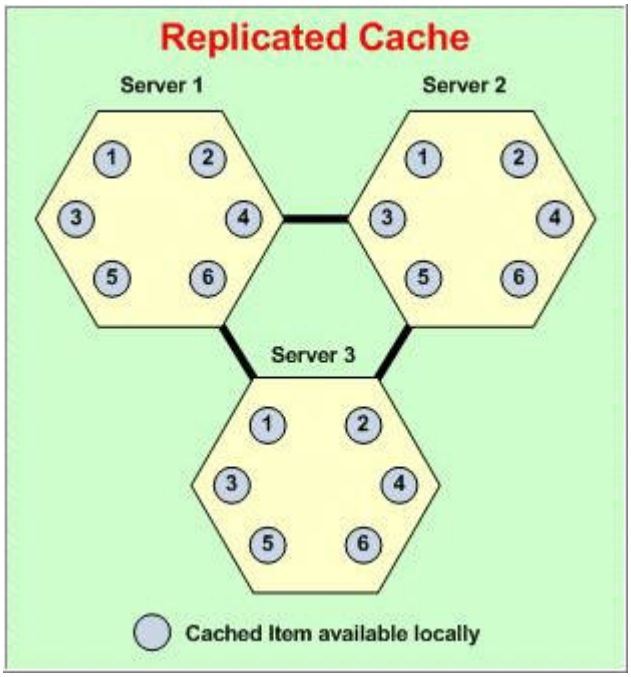

Figure 11: NCACHE Cluster

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In addition to the clustered cache, a client cache is also employed by Presentation Layer Web Servers to store a subset of the clustered cache. This multi-level cache provides an additional performance improvement by reducing clustered cache 'trips'.

NCACHE manages client (Presentation Layer, Web Servers) and server (Application Layer, Application Servers) caches.

4.3.3.1.3 Presentation Layer Technologies

This section defines the technologies that will be deployed on the presentation layer. The technologies proposed to be used for the presentation layer are ASP.Net (C#), HTML, JavaScript and CSS.

The software architecture will be compliant with the latest stable release of .Net, which is version 2.0. The presentation layer will be constructed in HTML layout, and look and feel is controlled by cascading style sheets (CSS) only.

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The structure will be built utilizing the Master Page functionality of .Net 2.0 with a main master page holding the common page components and a child Master Page holding the content for the main content of the site. The two master pages allow for the future addition of any pages that need the full width of the page (hide navigation). All web pages fall into varying categories and will be logically grouped to facilitate changing content via information from the query string or URL part.

4.3.3.2 Hardware

This section provides a high level overview of the computer hardware being employed by the Website Component. Note that sufficient storage and processing capacity will be maintained for the duration of the contract, and that sufficient capacity will initially be based on benchmark testing.

The Website Component will employ three different server configurations – they are:

- Web Server
- Application Server
- Database Server

Web Server

Each Web Server will possess the following:

- 2.66Ghz Dual Core Processor
- 2Gb RAM
- RAID 1
- Dual Ethernet Interface
- Windows Server 2003 R2, Web Edition
- IIS 6.0
- Network Load Balancing software - Network Load Balancing is a clustering technology offered by Microsoft as part of all Windows 2000 Server and Windows Server 2003 family operating systems. NLB uses a distributed algorithm to load balance network traffic across a number of hosts, helping to enhance the scalability and availability of mission critical, IP-based services, such as Web, Virtual Private Networking, Streaming Media, Terminal Services, Proxy, etc.

Application Server

Each Application Server will possess the following:

- 2.66Ghz Quad Core Processor
- 8Gb RAM
- RAID 1
- Dual Ethernet Interface
- Windows Server 2003 R2, Standard Edition

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Database Server

Each Database Server will possess the following:

- 2.66Ghz Quad Core Processor
- 8Gb RAM
- RAID 1
- Dual Ethernet Interface
- Windows Server 2003 R2, Standard Edition

4.4 Data Design

4.4.1 Data Layer Tier

The Data Layer is responsible for data storage and retrieval of traveler information for dissemination. A Relational Database Management System is the engine of the Data Layer.

The IDS Database Component supports, modeling and storage of:

- Real-time fused data from Data Fusion Subsystem via the FDOT C2C Plug-in Component;
- Traveler information timestamps for quality assurance;
- Traveler information data access by IDS Application Layer in a scalable manner;
- 511 personalization user profiles;
- Road network information;
- Aggregated data optimized for reports;
- System customization parameters to control/alter behaviour of subsystems.

The database is a critical component of IDS subsystem, and will provide:

- Efficient processing of transactions, without performance degradations during peak operating periods;
- Quick recovery when hardware or software failures occur, or when disaster strikes;
- High availability via failover capability that allows for the automatic transfer of workload from one system to another when there is hardware failure;
- Secure data with network encryption, database encryption, and strong authentication together to address privacy and compliance requirements;

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The Database Component system architecture consists of:

- High availability relational database management system;
- Redundant components: power supplies, network interface cards;
- Redundant server (clustered);
- Storage Area Network;
- RAID 5.

The IDS database component incorporates the following availability architecture:

- Oracle Server 10g Standard Edition;
- Microsoft Windows Server 2003;
- Microsoft Clustered Services (MSCS);
- Oracle Fail Safe;
- Clustered Server Hardware;
- Storage Area Network (SAN) in RAID 5 Scheme.

Oracle Fail Safe is a Windows product that makes Oracle Server Microsoft Cluster Services (MSCS) aware. Fail Safe is a plug in to MSCS to allow the Oracle instance and listener to be managed under the control of MSCS. This allows the Oracle instance to fail over in the event of a failure of one of the nodes.

The MSCS architecture is a two-server node sharing the same disk, of which only one system at a time is in control. In the event of a failure (determined by the heartbeat mechanism), the instance currently running the Oracle instance and controlling the storage is replaced by the standby system. The failover is seamless. This allows the Oracle database to be backed up and to run in a matter of minutes, thus improving availability.

Oracle Fail Safe is a core feature of Oracle10g for Windows and no additional license is needed.

With Oracle Fail Safe you can fail over the following Oracle components:

- Oracle Database Server
- Oracle Listener
- Oracle Intelligent Agent

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4.4.2 Data Dictionary – IBI Raw Data

The IDS Database Component is provided by a single instance of a relational database management system. This database will be comprised of the following functional collections (schemas):

- ATIS_RAW_DATA – Collection of database objects for storage and manipulation of fused data from Data Fusion Subsystem via FDOT C2C Plug-in Component;
- ATIS_PRODUCT – Collection of database objects for storage and manipulation of IDS prepared end-user traveler information "products" for consumption by the IVR, WEB, SMS components, etc.;
- ATIS_SUBSCRIPTION – Collection of database objects for storage of IVR and Web user personalization profiles;
- ATIS_SYSTEM – Collection of database objects that control the behaviour of the FLATIS System.

The complete data dictionary is provided in section Data Dictionary.

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4.4.3 Functional

The website will be implemented in accordance with Model View Control (MVC) framework, which is a widely accepted standard in the development of web applications. This methodology defines a clear separation between the front-end presentation and aspx pages (view), code behind classes and class libraries (control), and the separated business logic components (model).

Providing the interfaces remain unchanged, each part of the model can be developed independently from the other parts. This results in a clean separation of presentation and content, which makes the website more maintainable, and defines clear development roles and responsibilities.

The diagram below demonstrates the ASP.NET MVC Implementation Architecture.

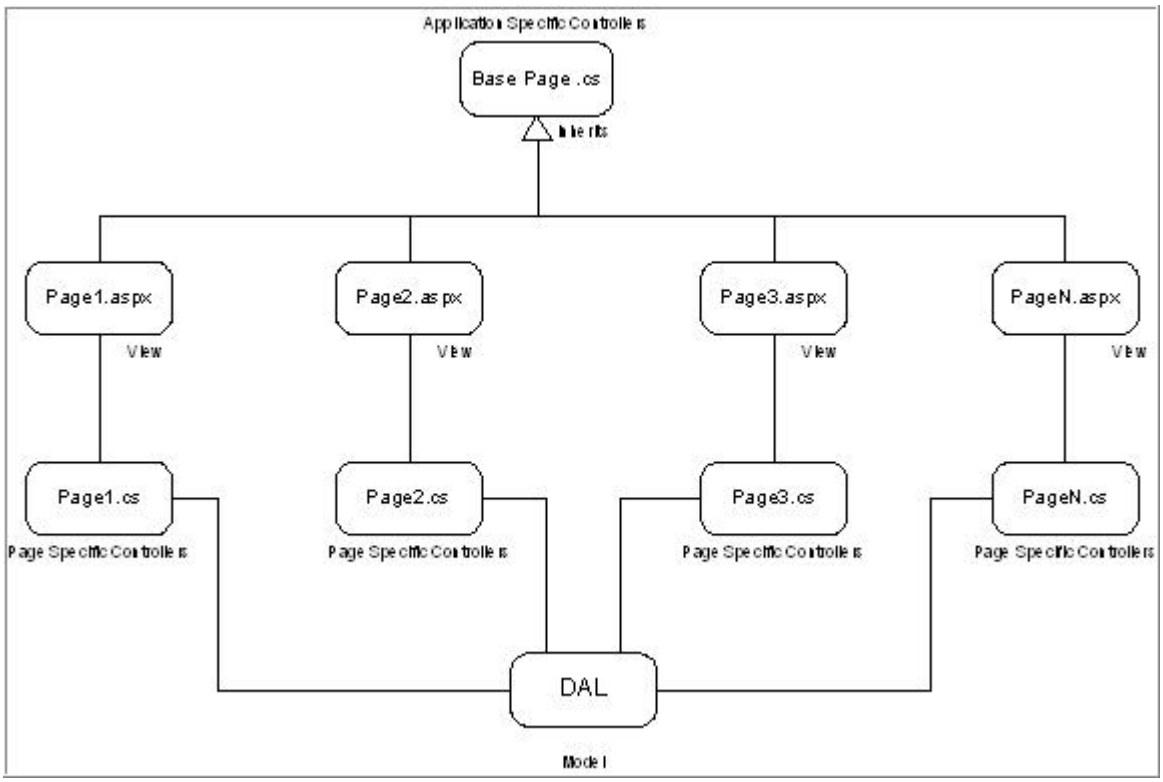

Figure 12: Model

Model

The model encapsulates data processing rules and database access. The Factory Method Design Pattern is implemented to eliminate the need to bind Application Layer classes to the View code. This architecture allows the controllers to acquire business objects regardless of the actual model implementation.

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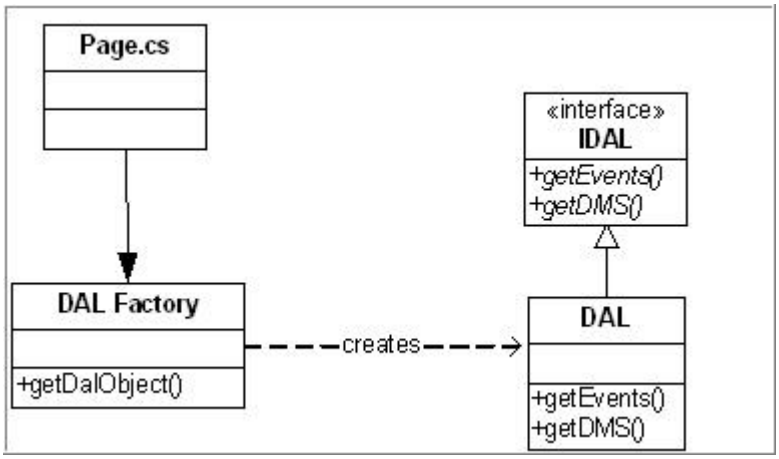

Figure 13: UML Representation of Factory Method Pattern Class Diagram

View

The User Interface uses ASP.NET Master Pages to provide a consistent layout for all the web pages. A single master page defines the common appearance and behavior factors for all of the web pages (navigational menus, floodgate messages, disclaimers, terms of service, etc) while individual content pages (traffic, links, etc) consist of the dynamic content. When users request the content pages, they merge with the master page to produce output that combines the layout of the master page with the content from the content page.

Controller

Page-specific controllers handle page requests and events, extract any relevant data, invoke any updates to the model, and forward the request to the view. The view in turn depends on the model for retrieval of data to be displayed. On the other hand, application specific controllers incorporate common functions and behaviors throughout the application and form a base class that is inherited by page-specific controllers.

4.4.3.1 Object Models for Website Component

This section describes the Web project and object models used by the Website Component. It considers the data and methods that are required to deliver the Website functionality specified in the ITN.

The object model diagram is based on a UML Class diagram, also known as a Static Structure diagram. It shows the relationship between the major classes of data used in this system, and identifies the functions associated with the data. All of the data and functions can be tied back to specific requirements in the ITN.

4.4.3.1.1 Projects Overview

The following diagram outlines the projects and their dependencies. AdminWeb and Web are the presentation layer projects. BLL is the Business Logic Layer. NCacheDAL manage the cache. All other projects are generated by TierDeveloper – the Data Object Mapping application. FLATIS.Busines.Domain contains domain objects which are referenced in all the other projects. FLATIS.Integration exposes the functions to retrieve, save or delete data.

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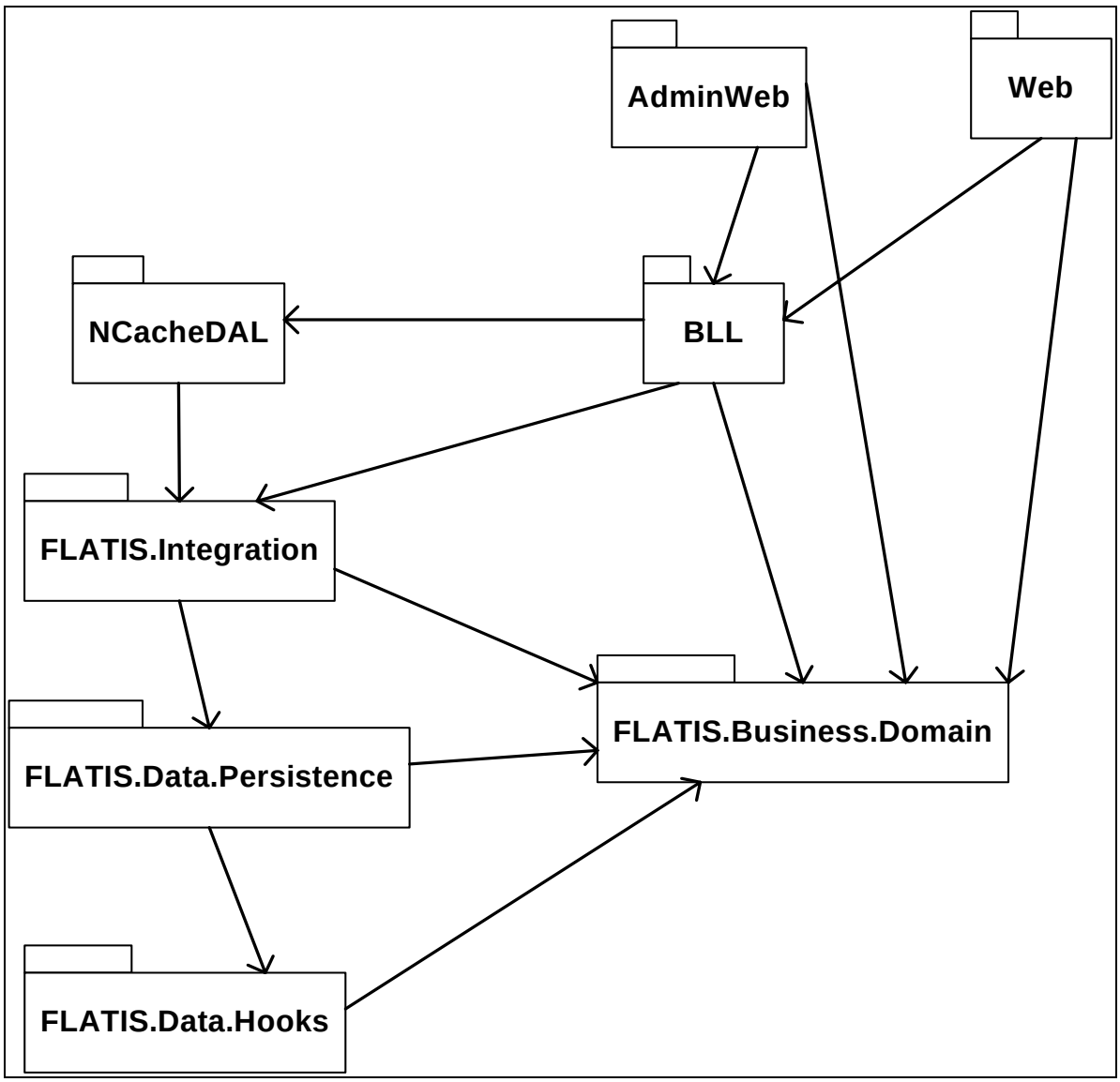

Figure 14: Object Model for website component

4.4.3.1.2 Object Model Overview

The object model diagrams are shown in Exhibit A. The nodes, such as Event, represent a class of object. An instance of the class is an object. The class can be defined as a collection of individual objects. The data elements apply to objects, and the methods may be class methods or object methods.

There are a few other objects needed to represent data on the website, such as FloodgateMessage and StaticDisplayData.

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The object model is similar to, but not the same as the IDS Database schema. Some table aggregations can be made in the model. For example, the Route object has a data item for “list of links”. In a schema, the Route would have to be represented by more than one table to accommodate this.

4.4.3.1.3 FLATIS.Business.Domain Classes

The following diagrams describe the classes in FLATIS.Business.Domain project. These classes serve to store data - they have attributes but no methods.

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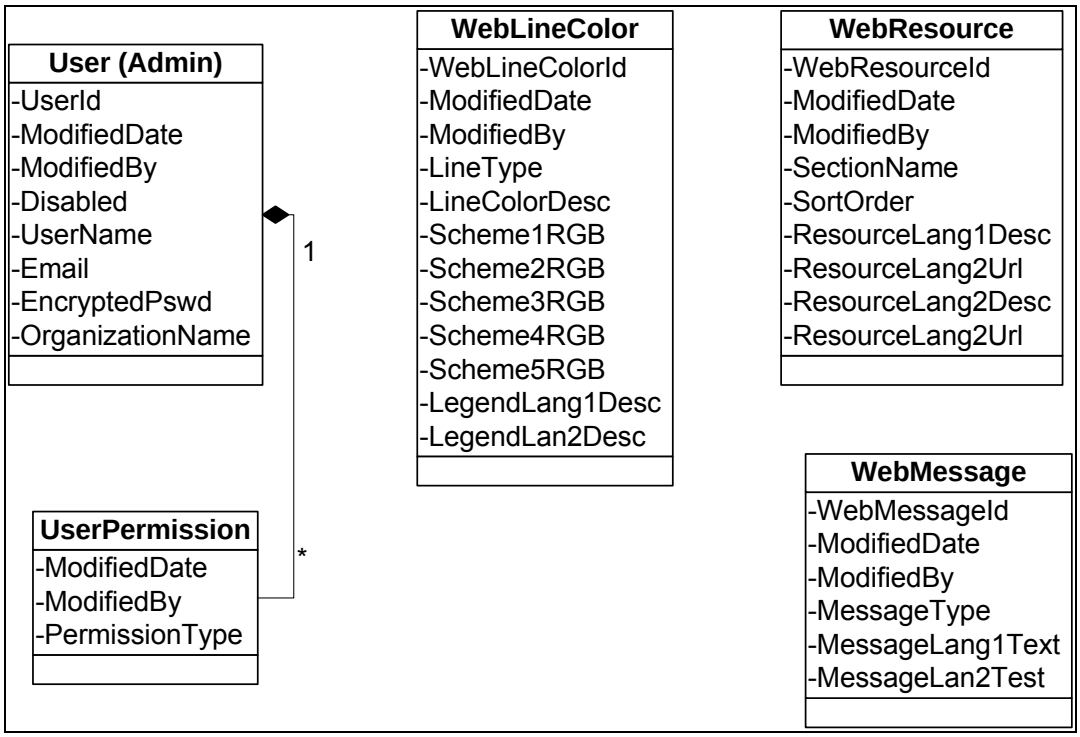

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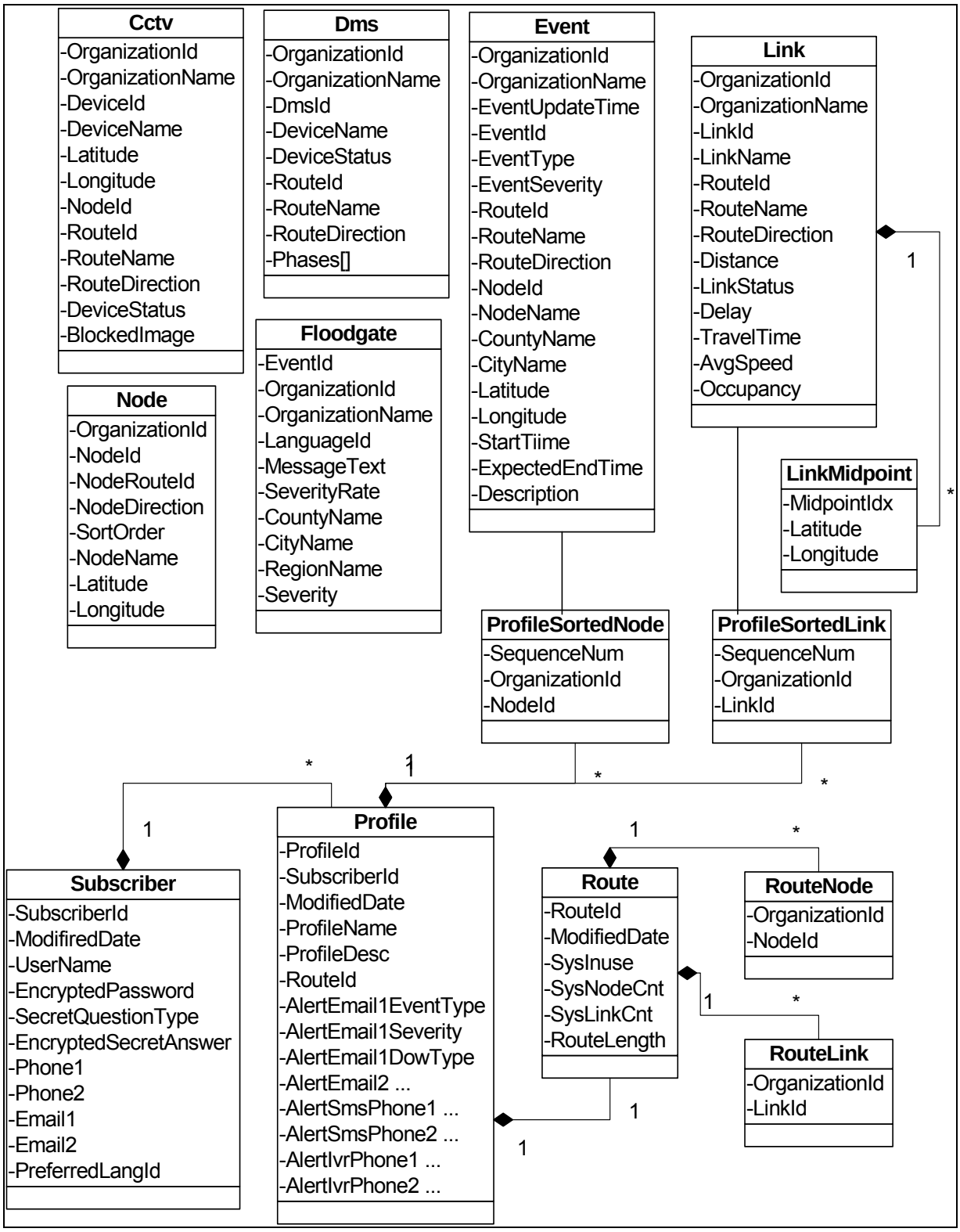

Figure 15: FLATIS Business Domain Classes

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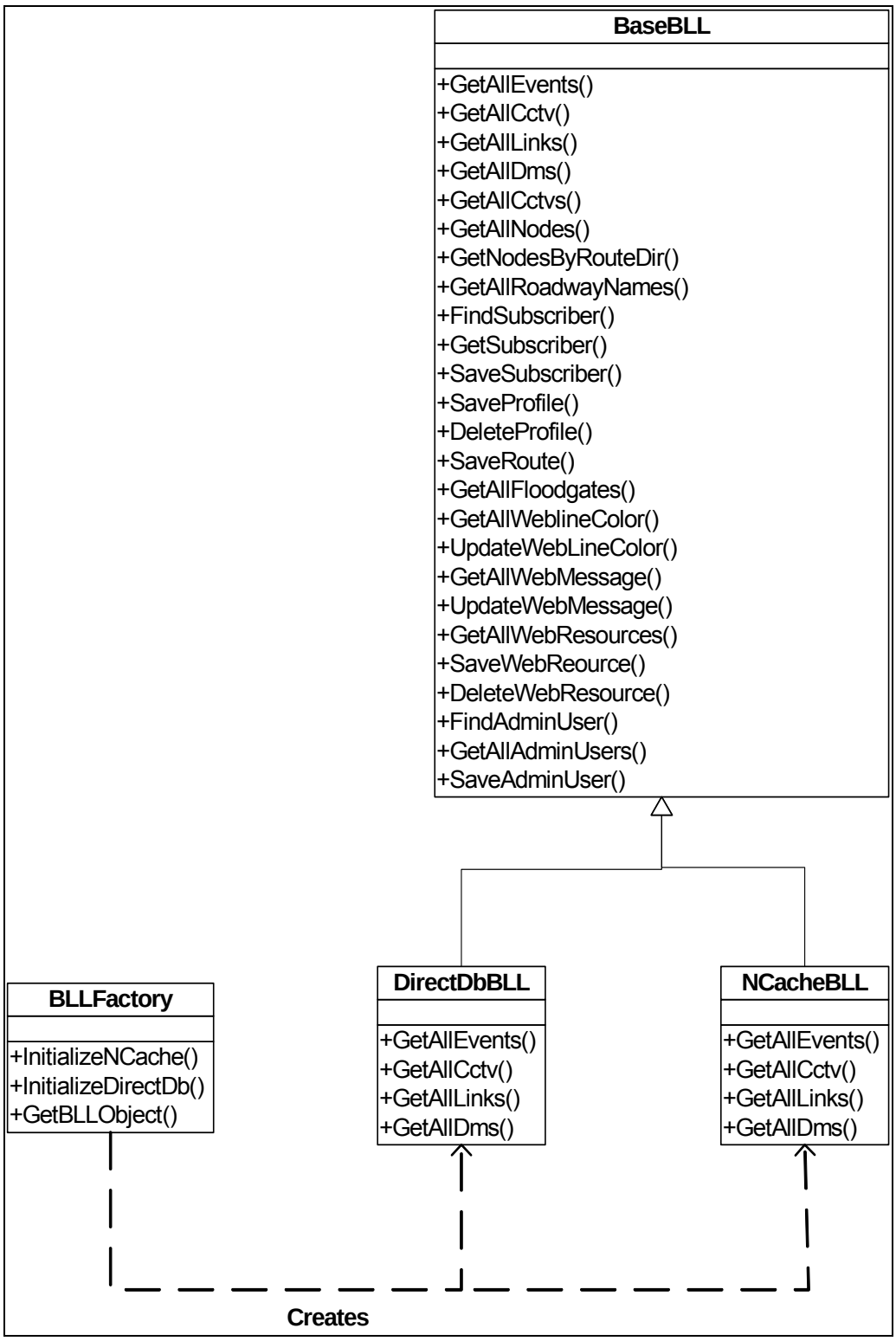
4.4.3.1.4 Business Logic Layer (BLL) Classes

The following diagram describes the factory pattern BLL project. BLLFactory creates BaseBLL object depending on configuration.



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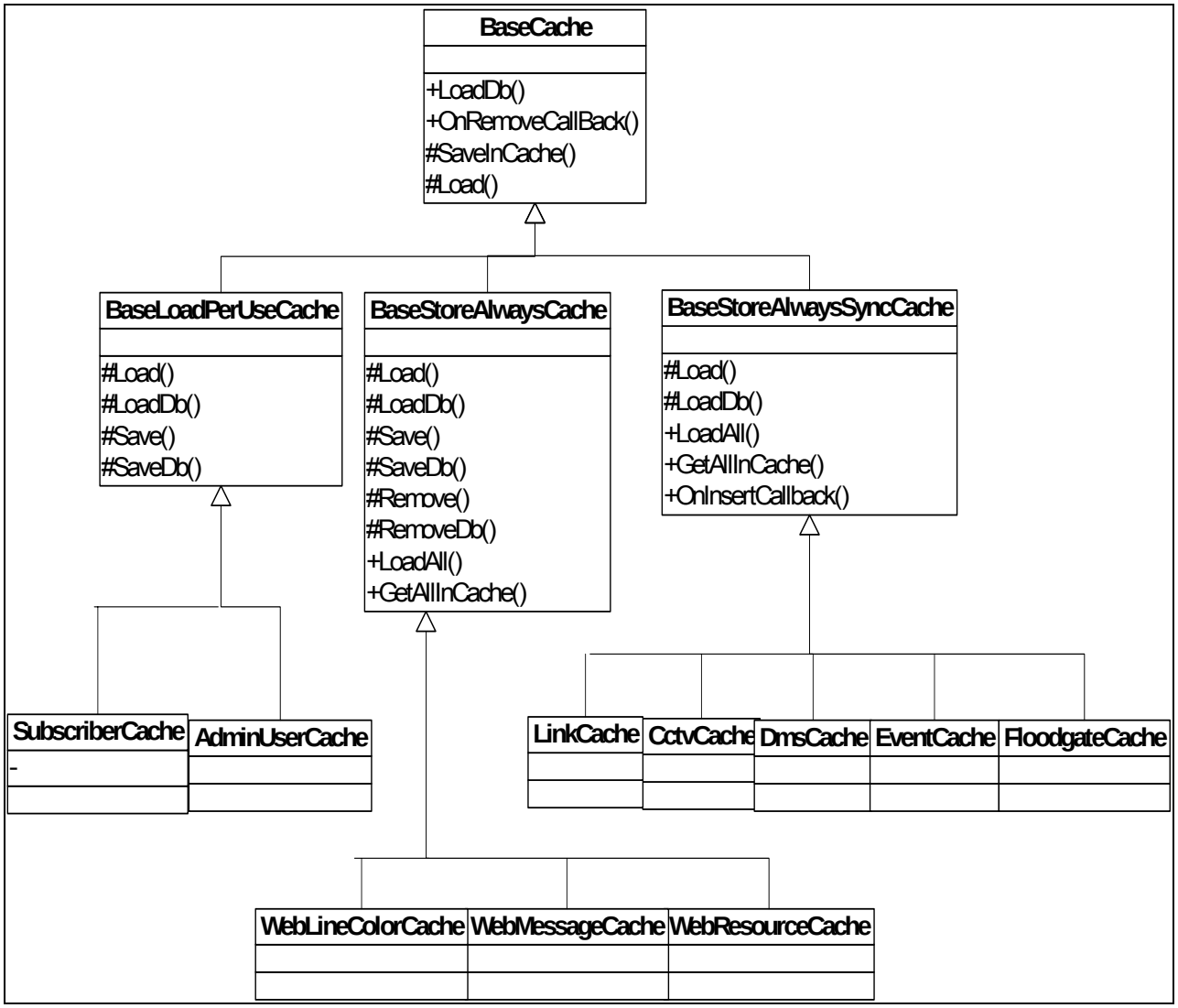
4.4.3.1.5 NCacheDAL Classes

The following diagrams describe the classes in the NCacheDAL (Data Access Layer) project. The parent classes provide common functionality for its child caches. BaseLoadPerUseCache is used when data only needs to be loaded occasionally and are removed according to the eviction policy. BaseStoreAlwaysCache objects are constantly stored in cache and not kept in sync with the database because all updates will be through NCacheDAL. BaseStoreAlwaysSyncCache objects are constantly stored in cache and kept in sync with database; they will not be edited through the NCacheDAL.



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4.4.3.2 Personalization Component

The user enters personal data such as email and mobile number through the MyFlorida511 Website. The relevant process then writes data into the Personalization IDS Database. When the Website, Email or SMS component needs information about subscribers, it will retrieve data from the Application Layer, which maintains cached data pulled from the Personalization IDS Database.

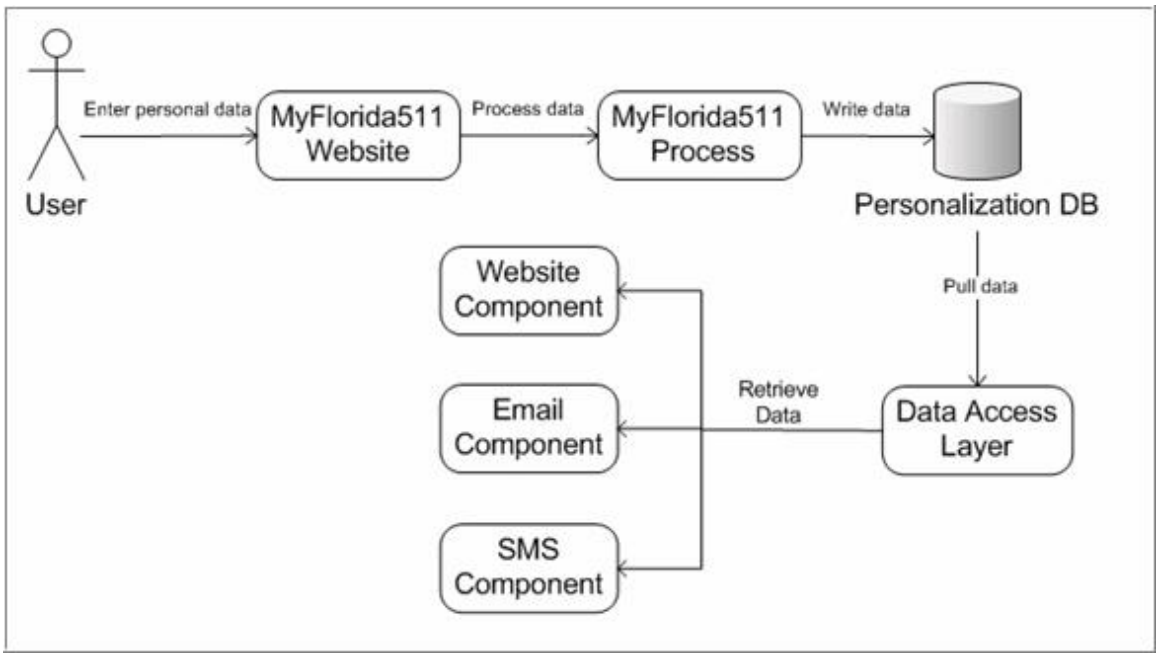

Figure 16: Personalization Component

4.4.3.3 Content Management Portal

The Content Management Portal website will be accessible to authorized personnel only; therefore forms authentication must be properly protected. ASP.NET's built-in authentication system will be used. ASP.NET version 2.0 Web applications configured for forms authentication use an authentication ticket that is transmitted between Web server and browser either in a cookie or in a URL query string. The authentication ticket is generated when the user first logs on and it is subsequently used to represent the authenticated user. It contains a user identifier and often a set of roles to which the user belongs. The browser passes the authentication ticket on all subsequent requests that are part of the same session to the Web server. Along with the user identity store, this ticket must be protected to prevent compromise of your authentication mechanism.

Failing to properly protect forms authentication is a common vulnerability that can lead to the following:

- Elevation of privileges. An attacker could elevate privileges within your application by updating the user name or the list of roles contained in the ticket, prior to posting it back to the server. An attacker, who can upload malicious code to your application, perhaps in a new ASPX page, can also successfully create and modify the forms authentication tickets.

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- Session hijacking. An attacker could capture another user's authentication ticket and use it to access your application. There are a number of ways that this could happen:
    - As a result of a cross-site scripting vulnerability.
    - If the transport is not being protected using a security mechanism such as Secure Sockets Layer (SSL).
    - If the ticket is stored in the browser cache.
- Session usage after sign-out. Even after the user has logged out of the application and the developer has called FormsAuthentication.SignOut, the authentication ticket remains valid until its time-to-live (TTL) expires, so it can be used by an attacker to impersonate another user.
- Eavesdropping. An attacker could look inside a forms authentication ticket to obtain any sensitive information it contains and use this information to compromise the application.
- Compromise of the user identity store. An attacker with access to the user identity store may obtain access to user names and passwords, either directly from the data store or by using a SQL injection attack.

To protect against these threats, the following counter-measures will be employed:

- HMAC-SHA-1. In cryptography, a keyed-Hash Message Authentication Code, or HMAC, is a type of message authentication code (MAC) calculated using a cryptographic hash function in combination with a secret key. As with any MAC, it may be used to simultaneously verify both the data integrity and the authenticity of a message. Any iterative cryptographic hash function, such as MD5 or SHA-1, may be used in the calculation of an HMAC; in this case, SHA-1 will be used. Any changes to the authentication ticket are detected at the server and an exception is thrown if it has been modified.
- Encryption. Encryption turns the clear text data contained in the forms authentication ticket into unintelligible cipher text. ASP.NET version 2.0 uses AES symmetric encryption to prevent anyone from viewing the contents of the forms authentication ticket. Advanced Encryption Standard. (AES) is a symmetric key encryption technique. The algorithm uses one of three cipher key strengths: a 128-, 192-, or 256-bit encryption key (password). AES provides strong encryption and has been selected by NIST as a Federal Information Processing Standard in November 2001.
- Session lifetime restrictions. Lifetime restrictions will be used to reduce the time window in which an attacker can spoof identity by using another user's captured authentication ticket.
- Enforced transmission over HTTPS/SSL. Prevents authentication tickets being transmitted over HTTP connections. This prevents an attacker from being able to view or modify the authentication ticket while it crosses the network. SSL (Secured Socket Layer) is a protocol developed by Netscape for transmitting private documents via the Internet. SSL uses a cryptographic system that uses two keys to encrypt data − a public key known to everyone and a private or secret key known only to the recipient of the message. Most browsers, including Mozilla Firefox and Internet Explorer, supports SSL, and many Web sites use the protocol to obtain confidential user information, such as credit card numbers. HTTPS is a URI scheme used to indicate a secure HTTP connection. Using an https: URL indicates that

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HTTP is to be used, but with a different default TCP port (443) and an additional encryption/authentication layer between the HTTP and TCP.

4.5 Human Interface Design

The following sections provide the reader with an understanding of the website human interface design. The site map illustrates the connectivity between pages and provides a high level overview of all components making up the web interface. Following the site map are descriptions and screen captures of all pages that encompass the FLATIS website.

4.5.1 Site Map

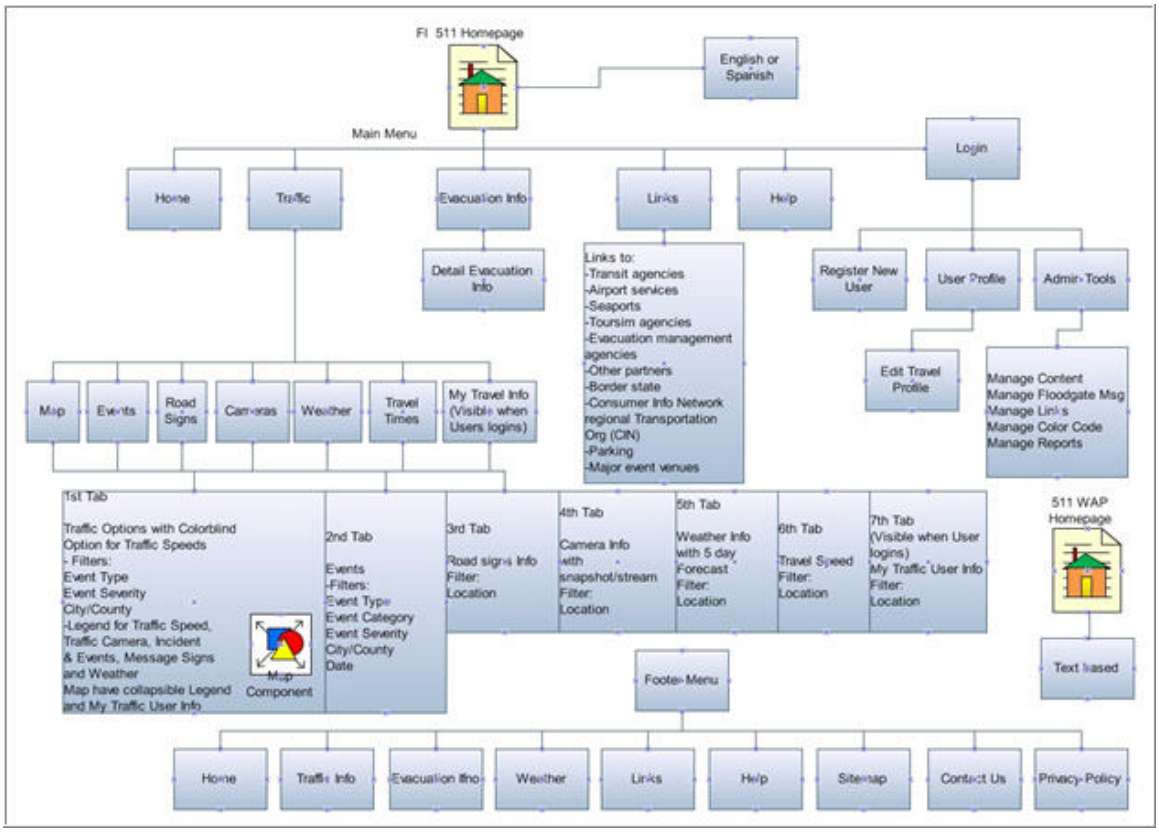

Figure 17: Site Map

The site map provides an overview of all the pages and functions of the site. The Main Menu (Home, Traffic, Evacuation Info, Links, Help and Login) is available from every page of the site. The Traffic Page provides all of the graphical (map) and textual information about incidents, road work, closures, and weather, and identifies the location and current information status being provided from CCTV cameras and road signs on the roadways. Users can also access travel times for identified segments and if the user has a personal account, he/she can receive route travel times from this page.

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4.5.2 Every Page

Pages in the website have some common features that ensure the user can reach most of the important information on the site from any page in the site. Information/Links shown on every page include:

- Header – Florida 511 image
- Menu – Menu options including:
    - Home
    - Traffic
    - Evacuation Info
    - Links
    - Help
- Printer Option
- Login status information
- Language Options
- Scrolling banner – displays floodgate messages
- Copyright notice
- Privacy Policy
- Disclaimer
- Footer links: Home, Traffic, Weather, Evacuation info, Links, Help, Sitemap, Contact Us

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4.5.3 Home Page

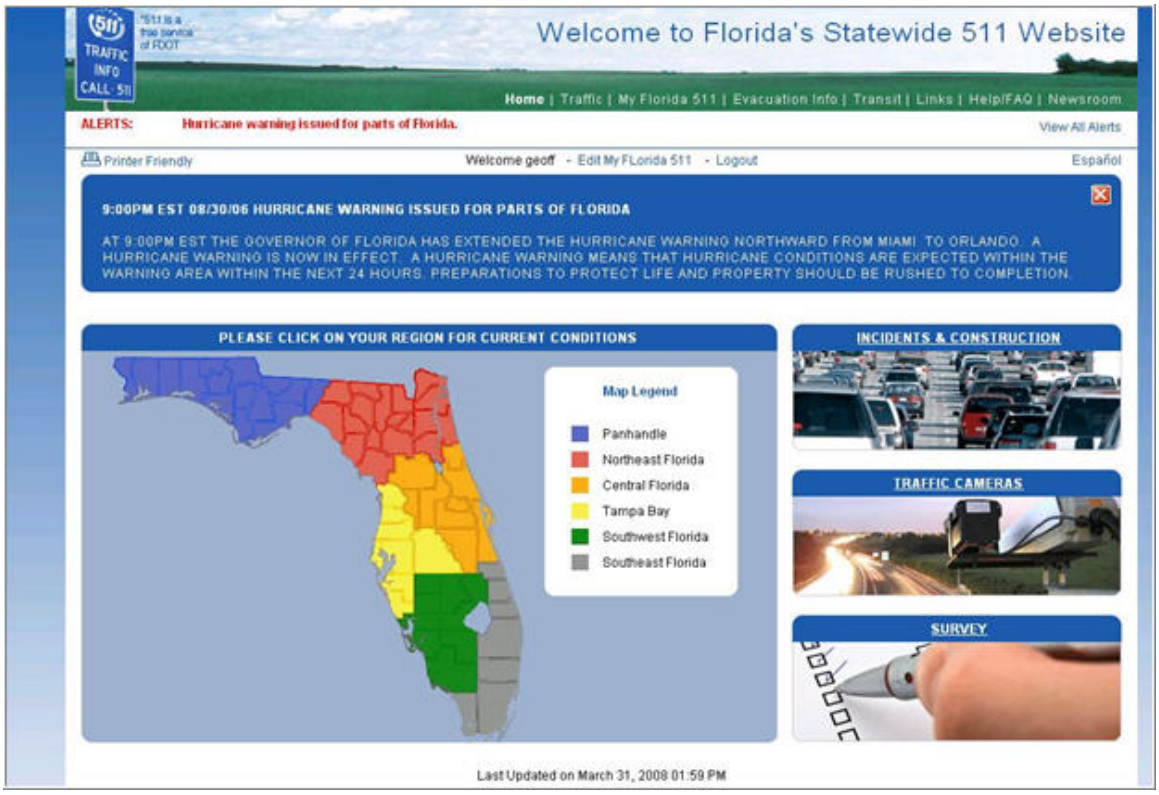

Figure 18: Home Page

The Home page format includes all of the components provided in Every Page and also:

- Override Message banner (optional).
- Link to open an email to contact the system administrator.
- The default map (given that the user is not logged in or has not changed the zoom level) is the full map of Florida. There will be region markers that when selected will zoom the map into the region level selected. The user will have the ability to zoom in and out on the map or select a particular county or city using a drop down menu at the top of the map.
- Graphical/textual links to 3 main information pages in the site: the map page displaying traffic speeds, incidents, or cameras.
- My Florida 511 Login option.
- My Florida 511 Sign Up link.

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4.5.4 Map Page

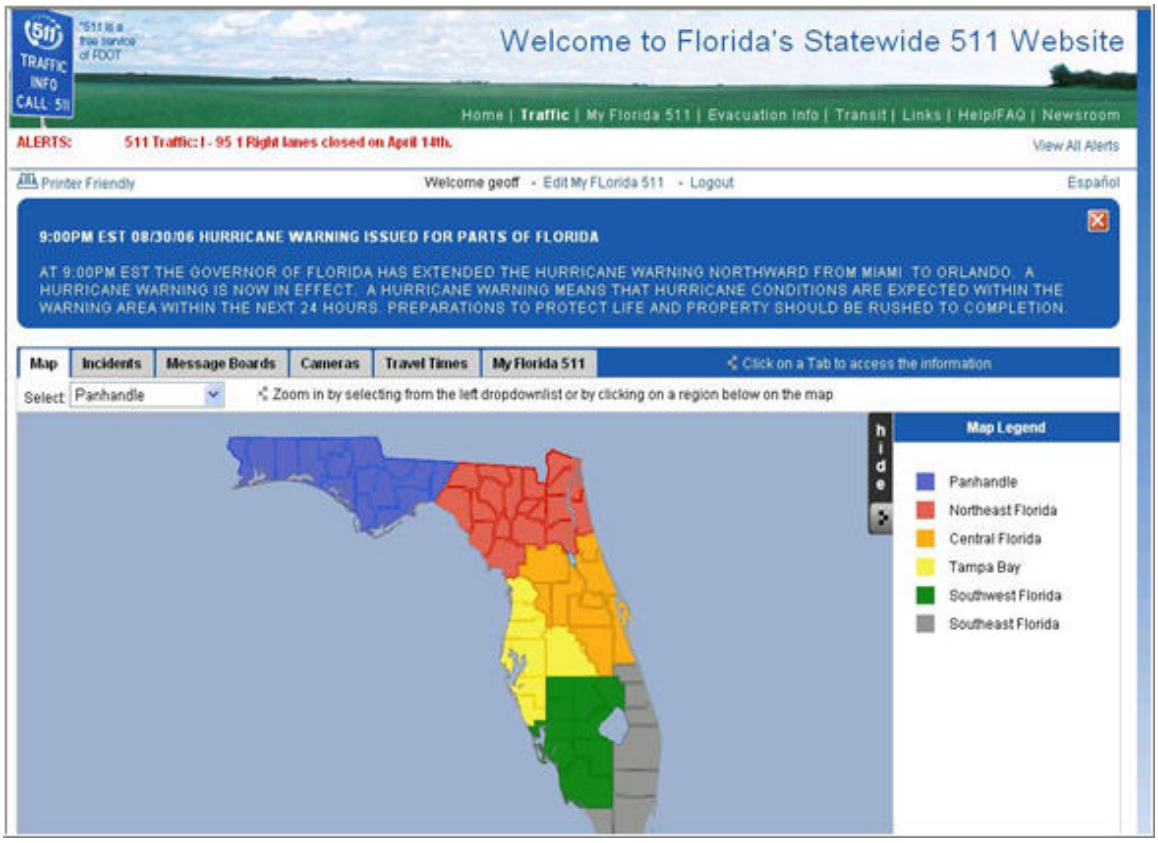

Figure 19: Map Page

The Map Page is the default page presented to the user when they open the 'Traffic' hyperlink from any page in the site. Components shown on the Map Page, other than those displayed on Every Page, include:

- Tabs for Traffic Information: Map, Events, Road Signs, Cameras, Weather, Travel Times, My FL511.
- If the user has logged into the site prior to getting to the map page, the map page will open at the personalized zoom in level and layers. The MyFL511 Travel Times checkbox will be checked and all of the users personalized routes will be highlighted.

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- Map Legend – the collapsible legend shows a list of traffic information layers that can be shown on the map, including an icon and check box for each layer. The user has the option to check one or more layers – when checked the layer will appear on the map if the map is zoomed into at least the region level. The traffic information layers include: Travel Speeds – when this layer is selected, color-coded links will be displayed on the map with the links color-coded according to roadway conditions. A color-code legend will also be shown. The default legend is green for "Fast", yellow for "Moderate", red for "Slow" and grey for "No Data". When the color legend is being displayed, there is a link to provide the user with an option to change color-coded links.
    - Cameras – when the check box for cameras is selected, the CCTV camera icons are displayed on the map by location.
    - Road Signs – when the check box for road signs is selected, the changeable message icons are displayed on the map by location.
    - Incidents – selecting the incident check box causes the incident icon to appear on the map at their location on the roadway.
    - Severe Weather – when the severe weather check-box is selected, severe weather icons appear on the map for locations where severe weather warnings are warranted. All severe weather events alerts/warnings will come from SunGuide. When this check-box is selected, it will display all active weather events received from SunGuide through DFS.
    - Travel Times – when the user selects the Travel time's check box, markers are shown on the map that identifies the midpoints of links. The user can then select a marker on the map and receive information about the current travel time for the selected link.
    - My FL511 Travel Times – if the user is logged in prior to entering the map page then the Map page opens with this check box already checked. If the user tries to check this check box and is not logged in, a pop-up box will appear that says the user must login to the site. The user will be sent to the login page. If this box is selected and the user is logged in, all of their personalized routes appear on the map. There is a drop-down box under this selection that allows the user to select one particular personal route.
    - When the user hovers or clicks on an icon on the map they receive more information or a graphical display about the icon.
- Map functionality includes zooming, panning, scrolling and zoom to location using the Location combo box at the top.

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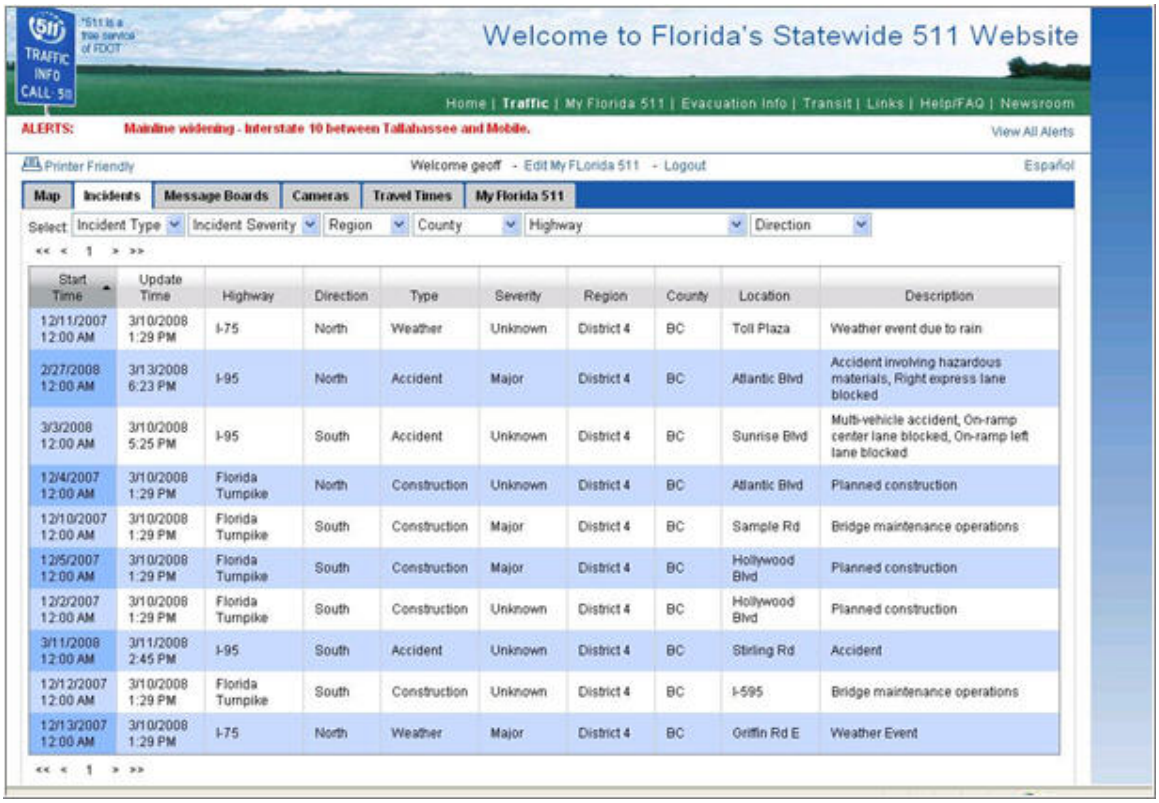
4.5.5 Events Text Page



Start Time	Update Time	Highway	Direction	Type	Severity	Region	County	Location	Description
12/11/2007 12:00 AM	3/10/2008 1:29 PM	I-75	North	Weather	Unknown	District 4	BC	Toll Plaza	Weather event due to rain
2/27/2008 12:00 AM	3/13/2008 6:23 PM	I-95	North	Accident	Major	District 4	BC	Atlantic Blvd	Accident involving hazardous materials, Right express lane blocked
3/3/2008 12:00 AM	3/10/2008 5:25 PM	I-95	South	Accident	Unknown	District 4	BC	Sunrise Blvd	Multi-vehicle accident, On-ramp center lane blocked, On-ramp left lane blocked
12/4/2007 12:00 AM	3/10/2008 1:29 PM	Florida Turnpike	North	Construction	Unknown	District 4	BC	Atlantic Blvd	Planned construction
12/10/2007 12:00 AM	3/10/2008 1:29 PM	Florida Turnpike	South	Construction	Major	District 4	BC	Sample Rd	Bridge maintenance operations
12/5/2007 12:00 AM	3/10/2008 1:29 PM	Florida Turnpike	South	Construction	Major	District 4	BC	Hollywood Blvd	Planned construction
12/2/2007 12:00 AM	3/10/2008 1:29 PM	Florida Turnpike	South	Construction	Unknown	District 4	BC	Hollywood Blvd	Planned construction
3/11/2008 12:00 AM	3/11/2008 2:45 PM	I-95	South	Accident	Unknown	District 4	BC	Stirling Rd	Accident
12/12/2007 12:00 AM	3/10/2008 1:29 PM	Florida Turnpike	South	Construction	Unknown	District 4	BC	I-595	Bridge maintenance operations
12/13/2007 12:00 AM	3/10/2008 1:29 PM	I-75	North	Weather	Major	District 4	BC	Griffin Rd E	Weather Event

Figure 20: Event Text Page

The Events page provides information in text format about incidents, road work, road closures and severe weather. The page includes the following:

- Tabs for Traffic Information: Map, Events, Road Signs, Cameras, Travel Times, My FL511.
- The page shows a list of events under the headings: Date, Time, Highway, Direction, Type, Severity, Region, County and Description.
- There are drop down filters at the top of the page to filter the information by event type, event severity, region, county, highway and direction. The user can select none, one or more filters as required.
- The table can be sorted by any row; the sorted row will be highlighted.
- All of the Every Page components described in section 4.5.2.

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4.5.6 Road Signs Page

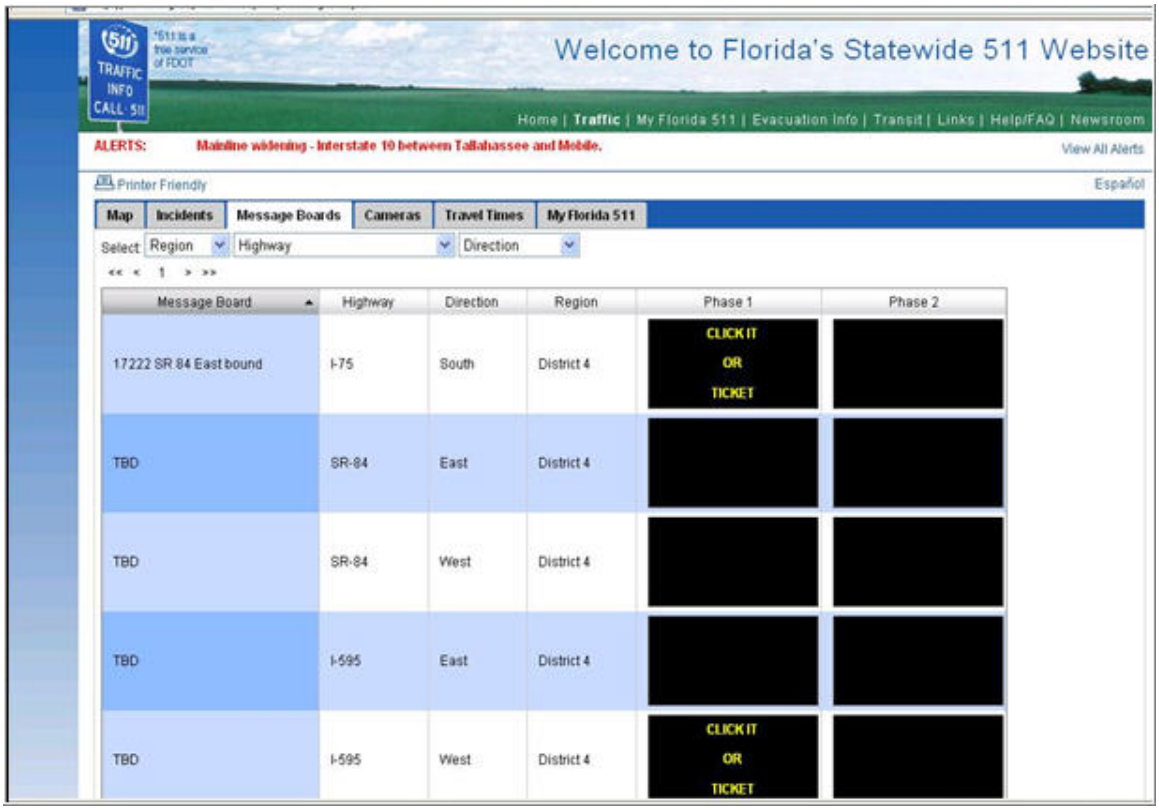

Figure 21: Road Sign Page

The Road Signs page provides information in text format about electronic message signs linked to the system. The page includes the following:

- Tabs for Traffic Information: Map, Events, Road Signs, Cameras, Travel Times, My FL511.
- The page shows a list of road signs under the headings: Message Board, Highway, Direction, Region, and current message Phase 1, and Phase 2.
- There are drop down filters at the top of the page to filter the information by region, highway, and direction. The user can select none or one filter as required.
- The table can be sorted on any column.
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4.5.7 Cameras Text Page

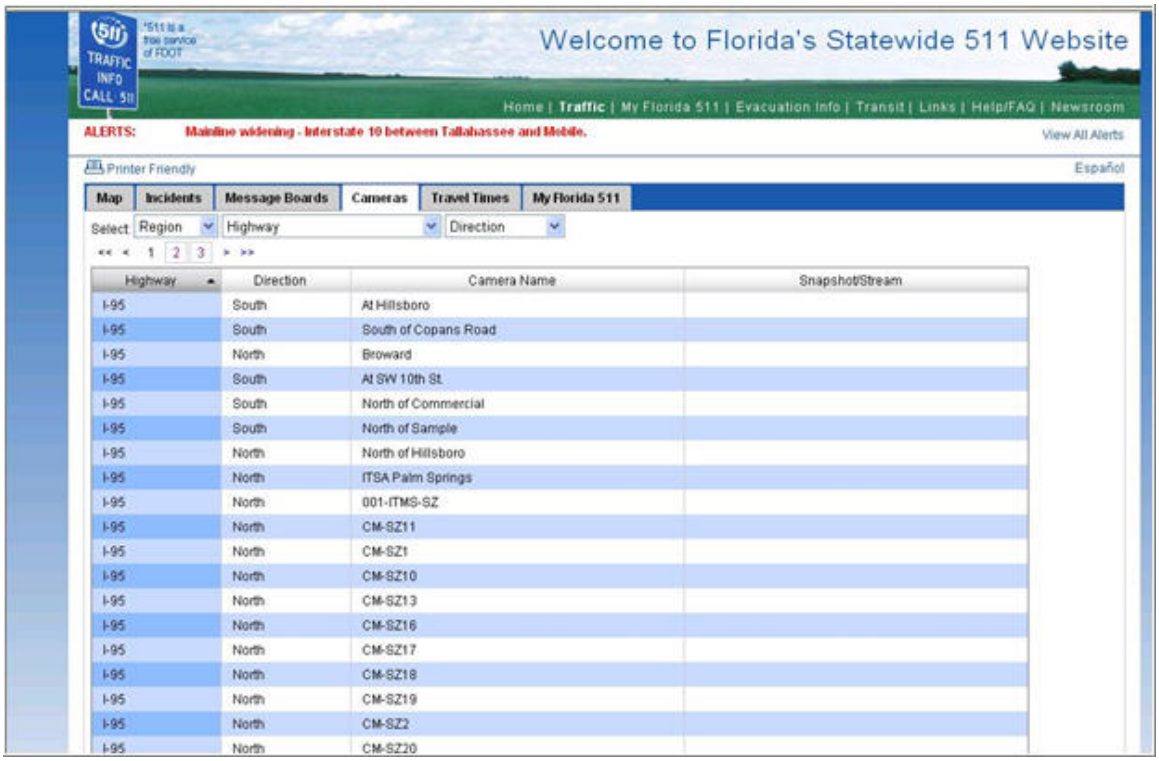

Figure 22: Cameras Text Page

The Camera page provides information in text format about CCTV cameras linked to the system. The page includes the following:

- Tabs for Traffic Information: Map, Events, Road Signs, Cameras, Travel Times, My FL511.
- The page shows a list of cameras under the headings: highway, direction, camera name, and snapshot/stream. The snapshot/stream will provide a hyperlink that when selected shows the current camera image. If the camera is selected from a district where there are only video streams provided, the video stream will be shown.
- There are drop down filters at the top of the page to filter the information by region, highway, and direction. The user can select none or one filter as required.
- The table can be sorted by any row.
- All of the Every Page components described in section 4.5.2.

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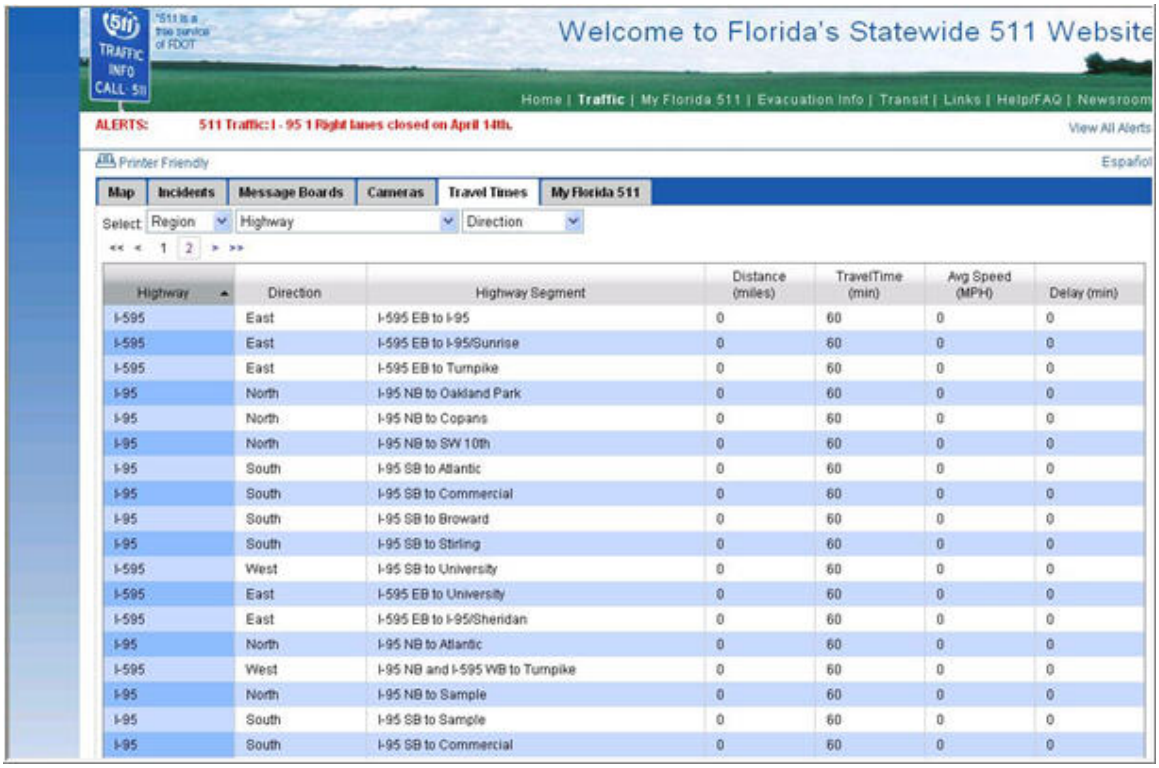
4.5.8 Travel Time Page



Highway	Direction	Highway Segment	Distance (miles)	TravelTime (min)	Avg Speed (MPH)	Delay (min)
I-595	East	I-595 EB to I-95	0	60	0	0
I-595	East	I-595 EB to I-95/Sunrise	0	60	0	0
I-595	East	I-595 EB to Turnpike	0	60	0	0
I-95	North	I-95 NB to Oakland Park	0	60	0	0
I-95	North	I-95 NB to Copans	0	60	0	0
I-95	North	I-95 NB to SW 10th	0	60	0	0
I-95	South	I-95 SB to Atlantic	0	60	0	0
I-95	South	I-95 SB to Commercial	0	60	0	0
I-95	South	I-95 SB to Broward	0	60	0	0
I-95	South	I-95 SB to Stirling	0	60	0	0
I-595	West	I-95 SB to University	0	60	0	0
I-595	East	I-595 EB to University	0	60	0	0
I-595	East	I-595 EB to I-95/Sheridan	0	60	0	0
I-95	North	I-95 NB to Atlantic	0	60	0	0
I-595	West	I-95 NB and I-595 WB to Turnpike	0	60	0	0
I-95	North	I-95 NB to Sample	0	60	0	0
I-95	South	I-95 SB to Sample	0	60	0	0
I-95	South	I-95 SB to Commercial	0	60	0	0

Figure 23: Travel Time Page

The Travel Times page provides information in text format about travel times for travel segments (links) in the roadway network. The page includes the following:

- Tabs for Traffic Information: Map, Events, Road Signs, Cameras, Travel Times, My FL511.
- The page shows a list of roadway segments in the system under the headings: highway, direction, highway segment, distance (in miles), travel time (in minutes), average speed (in miles per hour) and Delay (in minutes over the average).
- There are drop down filters at the top of the page to filter the information by region, highway, and direction segment. The user can select none, one or more filters as required.
- The table can be sorted on any row.
- All of the Every Page components described in section 4.5.2.

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4.5.9 My FL511 Page

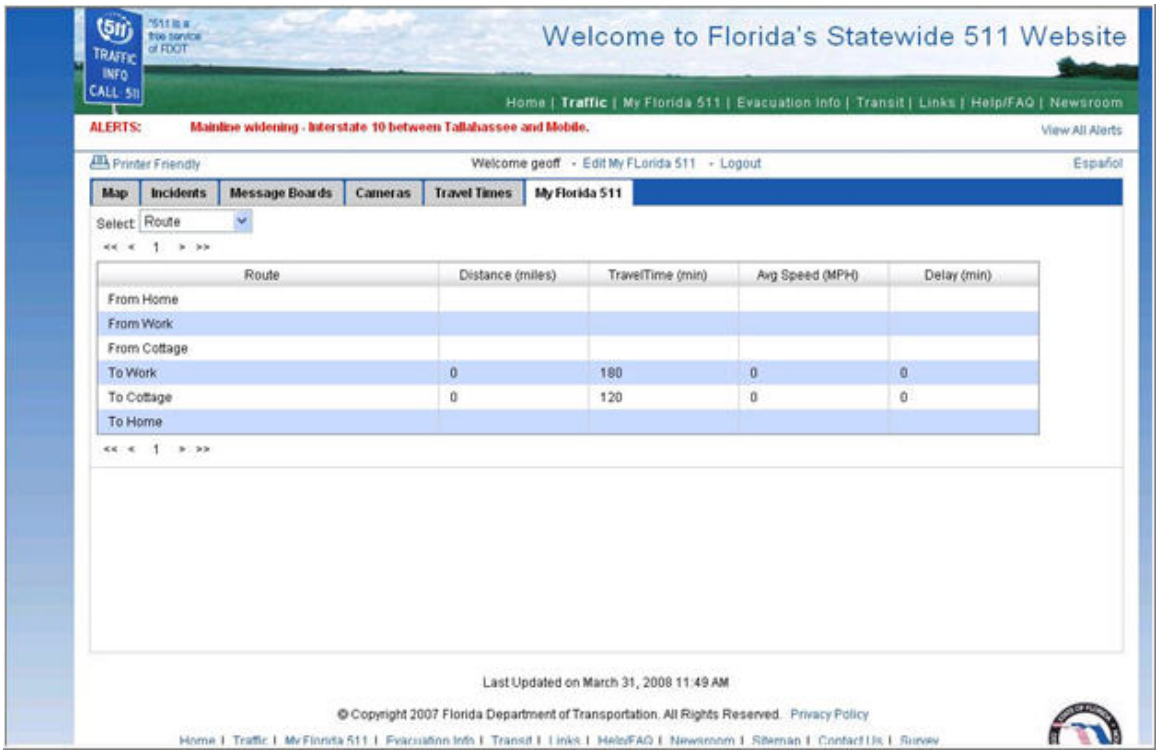

Figure 24: My FL511 Page

The My FL511 page provides information in text format about the user-determined routes that have been developed in the personalization section of the site. The My FL511 page includes the following:

- Tabs for Traffic Information: Map, Events, Road Signs, Cameras, Travel Times, My FL511.
- The page shows a list of all personalized routes, and information for each route under the headings: Route Name, Distance (in miles), Travel Time (in miles), Average Speed (miles per hour) and Delay (in minutes above the average).
- There is a drop down filter at the top of the page to allow the user to show a single route
- Clicking on a route in the list will display a list of all of the segments for the route and information for segment name, distance, travel time, average speed and delay for that segment, along with a total at the bottom of the list.
- All of the Every Page components described in section 4.5.2.

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4.5.10 Evacuation Info

The Evacuation Info page provides evacuation information as required. The evacuation page will be a link to an external page as provided by FDOT.

4.5.11 Links Page

Figure 25: Links Page

The Link page will provide a list of links to other agencies sorted by agency type. Agencies displayed in the link list include:

- Transit agencies
- Airport services
- Seaports
- Tourism agencies
- Evacuation management agencies
- Other partners
- Border state ATIS services
- Parking
- Major events
- All of the Every Page components described in section 4.5.2.

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4.5.12 Help Page

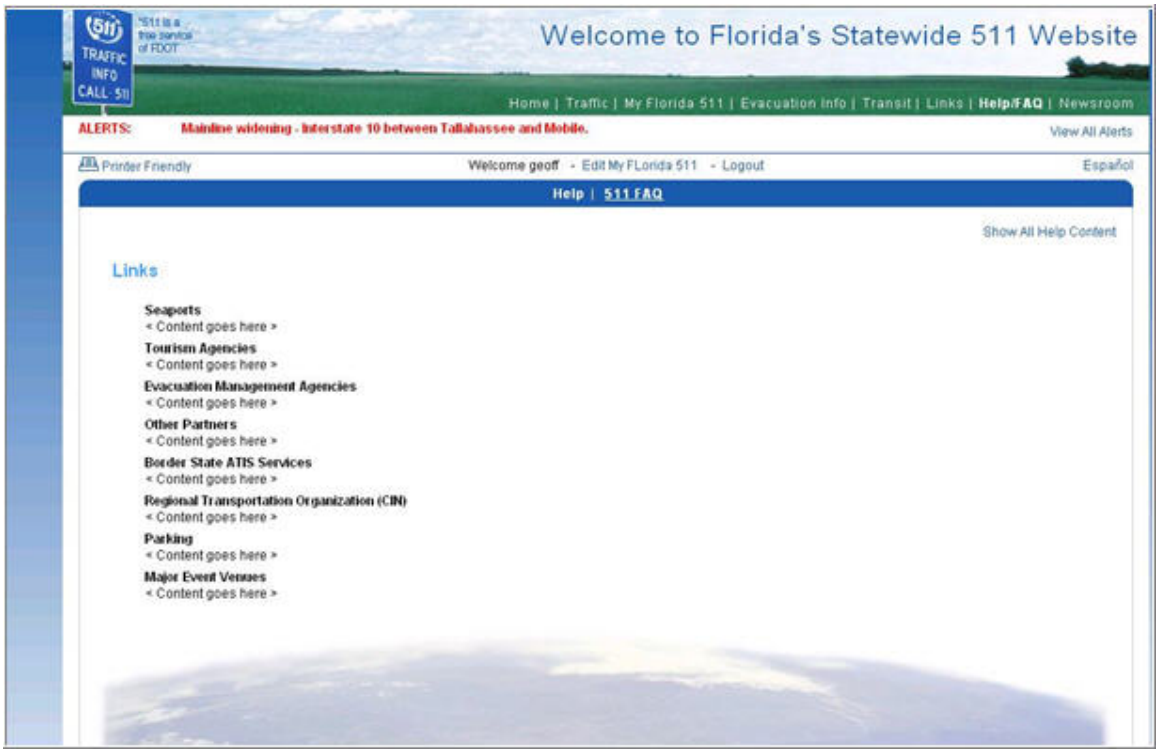

Figure 26: Help Page

The Help page provides text format help information about how to use every aspect of the site, information about the state-wide 511 system. The page will be set up in categories with a category for each page and a listing of context sensitive help for each page.

The main web site will be implemented with context sensitive help. On every Help Page HTTP request, the ASP.NET page code-behind file (contains application logic) will determine the previous/calling page making the request and will dynamically display the corresponding help content. Help content can be configured in language resource files, see Multi-language Support for more detail.

In addition, Tool tips will also available for all HTML page elements such as hyperlinks and buttons on mouse hovers.

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4.5.13 My FL511 Personalization

The Personalization section of the site has many functions. The user can enter their user login information, language preference, personal route selection, alert requirements and alert modes. There are 5 pages of personalization on the site. All of the "Every Page" components are also displayed on these pages.

The Personalization Component is responsible for managing subscriber accounts that allows subscribers to personalized traffic information and personalized traffic alerts.

Individuals can subscribe to personalized traveler information by selecting their desired origin/destinations pairs that is available as EM Locations on the map and dropdown boxes, to form a route consisting of ordered set of EM Locations that may span more than one roadway across districts.

Based on the route selected subscribers are prompted to select all travel times (TVT Links) that is associated with the origin/destinations pairs (EM Nodes).

Subscribers corresponding to the personalized route created beforehand can now request personalized traffic alerts.

4.5.14 Welcome to My FL511 Page

This page contains information My FL511, a description of the personalized services available and an area to login to the site. There are options for the user to retrieve a forgotten password and remember user id and password when the user visits the site again.

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4.5.15 MyFL511 Menu Page

This page provides a menu from which the user can:

- Edit Profile
- Manage Routes
- Manage Alerts

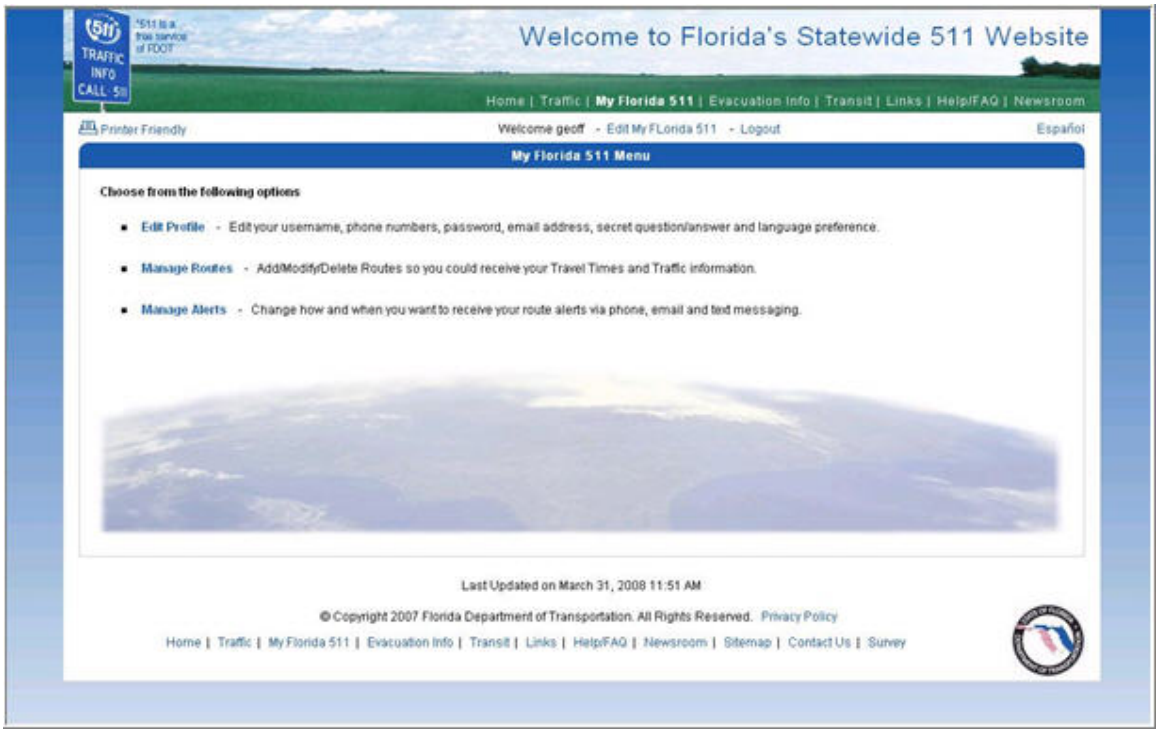

Figure 27: MyFL511 Menu Page

4.5.16 My FL511 Profile Page

The My FL511 Profile page is the means for the user to register for personalized information and also to update their personal data. Information provided by the user on this page includes:

- Username
- Password
- Password Confirmation
- Email Address
- Email Confirmation
- Primary and Secondary Phone Numbers (cell phone, home phone or SMS0
- Language Preference
- Secret Question and Answer

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To add or update personal travel routes. The user can create an unlimited number of routes. A route is a collection of sequential road segments. It is the user's responsibility that the segments are sequential and in the correct direction. These routes are the basis of the travel information shown on the personalized portion of the site. They are also the segments that will determine the location of the alert information that will be relayed to the user

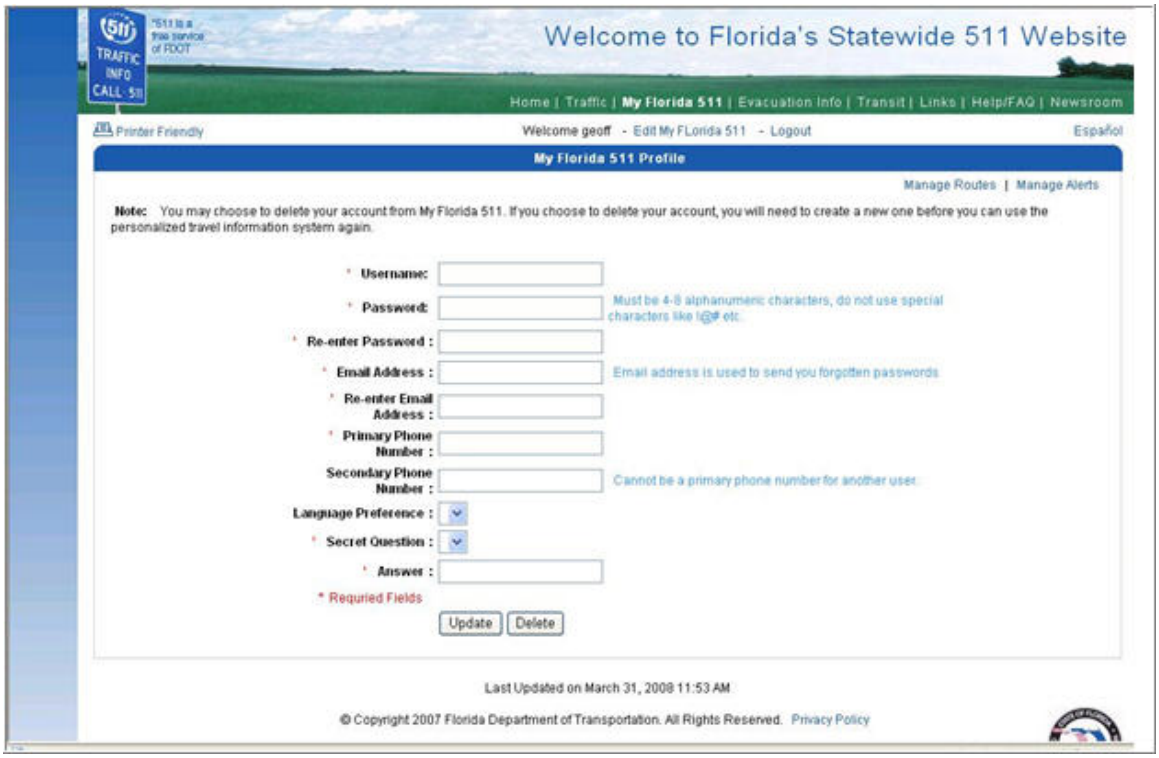

Figure 28: My FL511 Profile Page

4.5.17 My FL511 Routes

On the MyFL511 Routes page, a user can select up to 10 personal routes either by text selection or by selecting ordered EM locations on a map along a roadway. Users will also be able to associate Travel Time with their routes by selecting Travel Time Segments that are available along their route.

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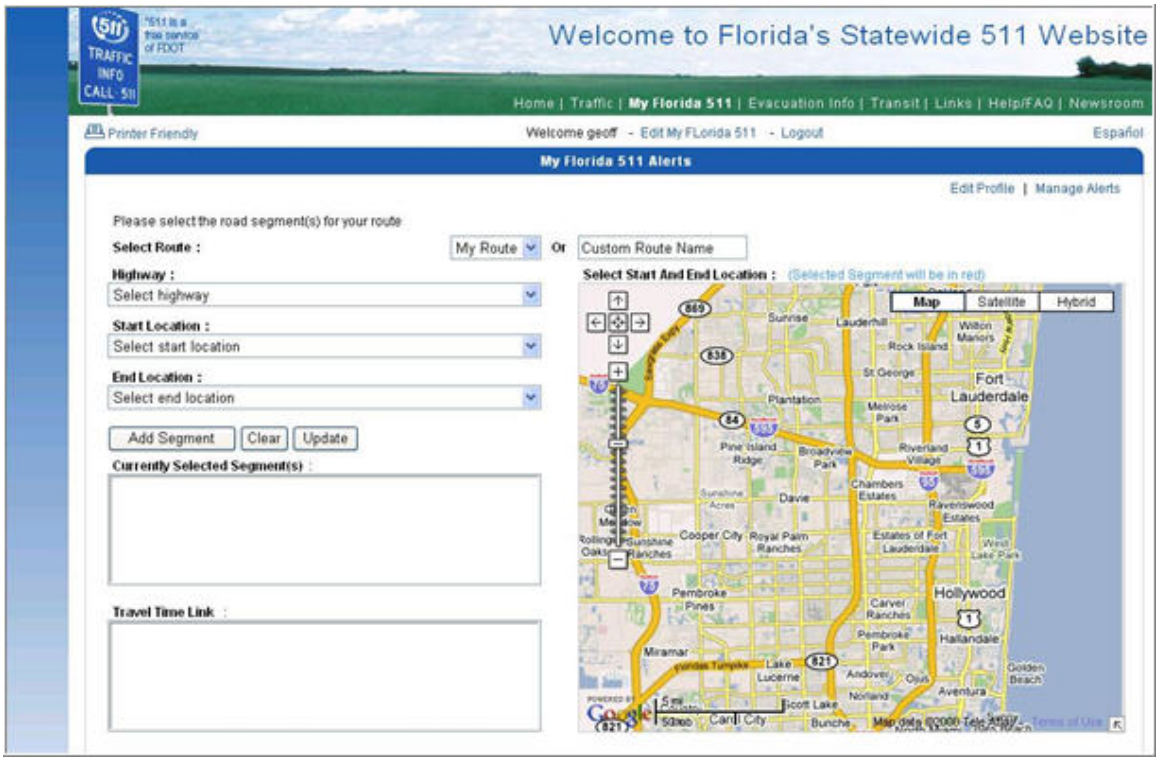

Figure 29: My FL511 Add Routes

4.5.18 My FL511 Alerts

The My FL511 Alerts page provides the user with a means to personalize and format their information alerts. These can be updated at any time. Alert information is provided for events that affect any of the user's personal travel routes. The following information is required to set up alerts:

- Route
- Receiving mode (telephone, SMS, email)
- Type of event (incident, road/lane closure, road work/construction, severe weather);
- Severity of event (urgent, critical, important, routine)
- Time of day (am peak, mid-day, pm peak, evening)
- Day of the week (weekday, weekend)

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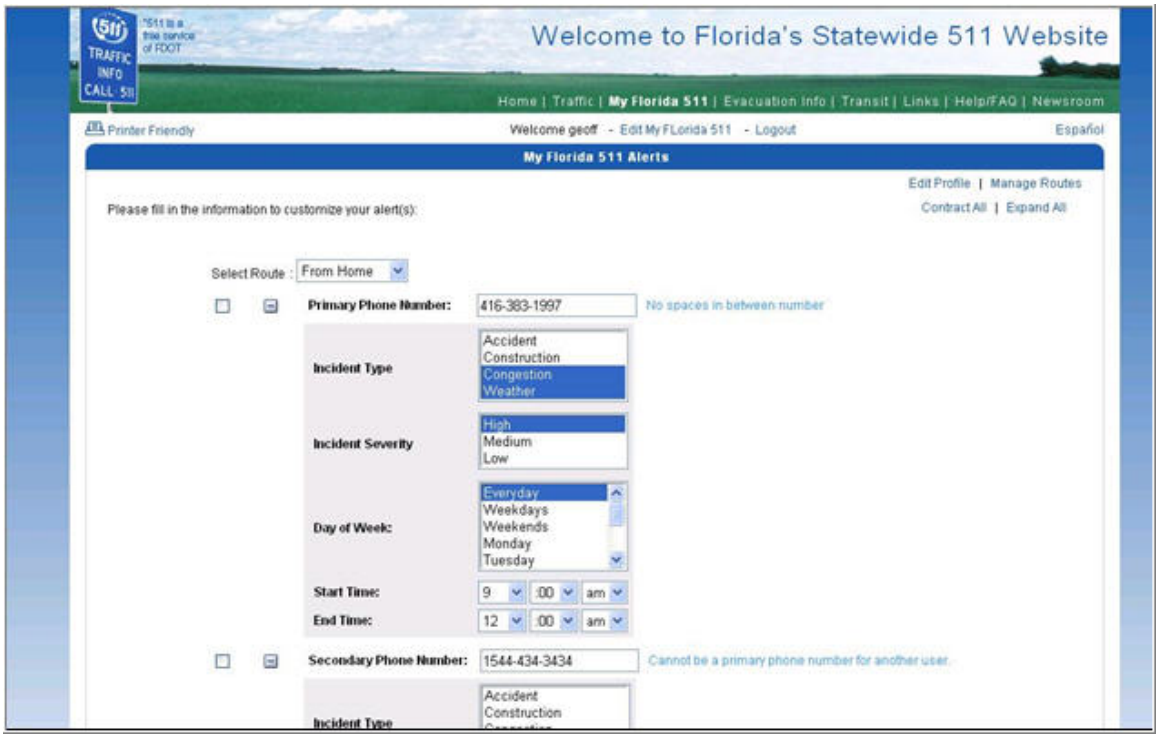

Figure 30: My FL511 Alerts

4.6 Interfaces

4.6.1 Internal Interfaces

The following internal interfaces will be part of the IDS-WEB Subsystem:

- **C2C Plug-in**: The C2C Plug-in will interface to the IDS Database via an ODBC connection. ODBC provides a product-neutral interface between front-end applications and database servers, allowing applications to be transportable between servers from different manufacturers.

4.6.2 External Interfaces

- **SunGuide C2C Interface**: Refer to 'SunGuide Center-to-Center Interface Control Document, SunGuide-C2C-ICD-4.0.0', which describes the interface between the IDS C2C Plug-in and the IDS Database.
- **Video Aggregation Subsystem**: Section 7 describes the interface between the IDS Website and the VAS.

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4.7 Subsystem Testing

4.7.1 Testing Procedure

Requirements Analysis: During the design phase, testers work with developers in determining what aspects of a design are testable and under what parameter those tests work.

1. Test Planning: Plan for the activities will be carried out during testing.
2. Test Development: Building Test Cases, Test Scripts and Test Environments to use in testing software.
3. Test Execution: Testers execute the software based on the plans and tests and report any errors found to the development team.
4. Test Reporting: Once testing is completed, testers generate metrics and reports.
5. Retesting the Defects: Bug fixes are verified.

4.7.2 Testing Scope

4.7.2.1 Unit Testing

Each component of the software (such as Application Layer, Map Component, and Web Component) is tested to verify that the detailed design for the unit has been correctly implemented.

4.7.2.2 Integration Test

This test proves that all components of the system interface with each other correctly and that there are no gaps in the data flow. For instance, event data is retrieved by the Application / Data Access Layer and displayed correctly in a public web page.

4.7.2.3 Functional Testing

The objective of this test is to ensure that each element of the application meets the functional requirements outlined in the Requirements Catalogue. Each requirement will be covered by one or more test case. This stage will also include Validation Testing, which is the intensive testing of valid, invalid and limit data input; browser and system compatibility; ADA compliance. Web accessibility will be tested using a third party tool - CSE HTML Validator, which has an accessibility checker validating ADA compliance.

4.7.2.4 Performance and Stress Testing

The web site will be tested to handle a minimum of 25 million page views (ID002W), which is the equivalent of performing up to 100Mbps delivery of web content. This will be tested using a web stress tool, WAPT. WAPT 4.0 is a load and stress testing tool that provides an easy-to-use way of testing web sites, web servers, and intranet applications with web interfaces. This tool helps to see the number of concurrent users one web server is able to support with any given page refresh rate. Based on this, concurrent user peak load and yearly page views that the system can support will be calculated. This is defined in more detail in the Performance Monitoring and QA Plan Document. One can test and analyze the performance characteristics under various load conditions to find bottlenecks of the web applications.

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Testing will be grouped into two areas:

- Testing of the web application to support 100 Mbps of bandwidth
- Stress testing to determine the break point and next logical point of failure when possible given time and operational constraints. NB there are no pass criteria for this test.

4.7.2.5 System and Integration Testing

This test verifies that the system is integrated to all external centers and components, such as the personalization component, and the completely integrated system meets all requirements.

4.7.2.6 Acceptance Testing

This test ensures that the system operates in the manner expected, provides all expected features, and any supporting material such as procedures, forms etc. are accurate and suitable for the purpose intended. It is high level testing, ensuring that there are no gaps in functionality.

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5 IDS SUBSYSTEM-IVR

5.1 Introduction

This section presents the system design for the FL-ATIS IDS Subsystem IVR Component.

5.1.1 Purpose

The purpose of this section is to present the IVR components of the FL-ATIS IDS to both FDOT management and technical personnel in such a manner that they will have a thorough and clear understanding of the various components of the IDS IVR and how they interact with one another, end users, and the C2C interface to the DFS.

5.1.2 Scope

IVR Interface – This component provides user telephony access to the FL-ATIS IDS database and its contents to retrieve traffic incident information, travel time information (where available), and information related to specific personalized routes of travel as previously set up by the user via the web-based personalization module. The IVR will also give the caller the location of rest areas and the amenities found at these rest areas.

In addition, users will be able to access non-traffic related information and services such as airports and seaports, adjacent state 511 systems, and public transit services via telephone transfer.

Alerts Processor – This IDS component processes the alerts as defined by each user via the web personalization module. Alerts can be sent to registered users based on time of day, day of week, personalized route, and type of alert. Users can select alerts to be sent to them via telephone, SMS (text messages), or e-mail.

5.2 System Overview

FL-ATIS is designed as an integrated traveler information system whereby public can access FDOT-generated information pertaining to traffic incidents and travel times on Florida roadways, as well as rest stops, adjoining state 511 systems, and other transit and travel services such as airports, seaports, and public safety services, via telephone transfer.

It is the intent of FDOT and its participating contractors to design and develop a fully integrated automation system to provide these services to the traveling public in the state of Florida. To do so, the system will consist of three (3) major system components: the Information Distribution Subsystem (IDS), the C2C interface, and the Data Fusion Subsystem (DFS). The IDS consists of a web browser interface and an IVR caller interface, along with the necessary databases to retain traveler information. The Data Fusion Subsystem (DFS) will provide the data needed by the IDS and generated by FDOT operators using the SunGuide application. This SunGuide generated data will be transferred to the IDS over a data feed, the C2C interface, which will receive its data from the FDOT Regional Transportation Management Centers (RMCs) via the DFS.

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5.2.1 511 Translation

The 511 translation will allow any caller within the state to reach the 511 IVR system by dialing 5-1-1. The 511 dialed numbers will be translated into an 800 number that will be terminated in LogicTree's IVR processing center.

5.3 System Architecture

5.3.1 VoxLinx Platform

The VoxLinx platform provides the necessary tools and components to develop a complete Interactive Voice Response (IVR) 511 application. The 400-port IVR VoxLinx platform will be dedicated to the FL-ATIS project. The two core components of the VoxLinx platform are SpeechGate and the InfoGate. The following figure shows the main components that make up the VoxLinx Platform. Details for each component are in the following sections.

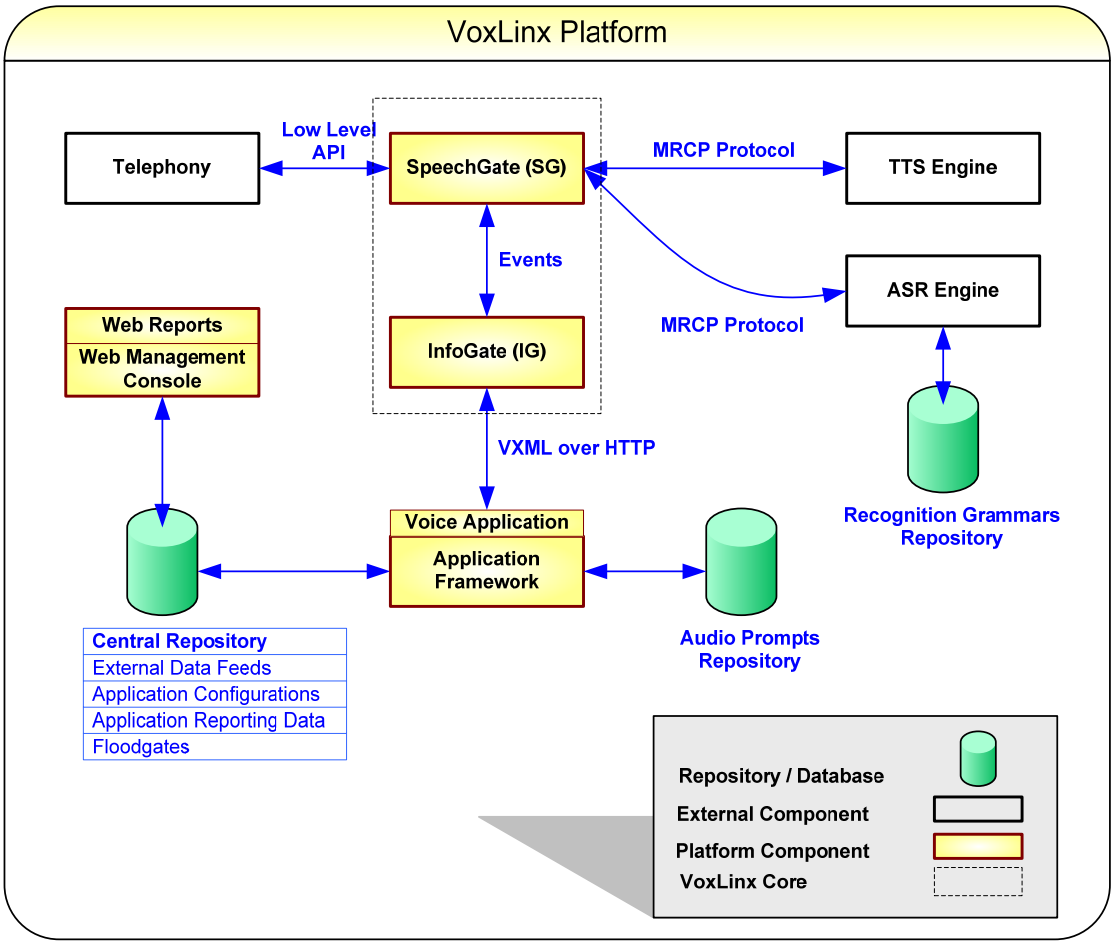

Figure 31: VoxLinx Platform

5.3.2 SpeechGate

SpeechGate (SG) is a software component that provides integration of telephony hardware with the rest of the platform. Some of the main SG responsibilities include:

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- Hardware abstraction that provides low level communication with telephony hardware
- Voice Streams and DTMF signal processing
- Automatic speech recognition via voice recognition engine integration
- Text-To-Speech (TTS) conversion via Text to Speech engine integration
- Audio playbacks on telephony lines

SG provides abstraction layers that allow seamless integration of 3rd party Voice Recognition and TTS conversions with IVR platform.

SG also integrates with telephony hardware through hardware abstraction layer that allows communication with telephony hardware using low-level APIs. By using low-level API communication between telephony hardware and SpeechGate, performance is enhanced and optimized. This requires SpeechGate to be present on the same telephony servers to reduce latency and network congestion at cost of tighter integration. However, due to this tight integration, the calls are processed immediately without any delays. SG also generates logs for all the calls coming to the system for traceability and reporting purposes.

5.3.3 InfoGate

InfoGate (IG) is a VXML interpreter that is responsible for processing a VXML document. Following are the main steps that are carried out by IG for document processing.

- Retrieve the document from a (web-based) VXML Application.
- Parse the document and generate event messages for each dialog interaction in the VXML document.
- Send event messages to the SG for processing.
- Receive event response messages from SG and retrieve interaction result.
- Pass on interaction results to the VXML Application, as described by the VXML document.

IG also generates logs for all the calls coming to the system for traceability and reporting purposes.

5.3.4 Voice Application

The Voice Application is a web-based application that contains the implementation of the voice user interface design and associated business logic. The Voice Application is built using the IVR Application Framework which provides flexibility of writing voice applications and provides all necessary components in an integrated environment. Some of the key components of the IVR Application Framework are:

- Multi Language Prompt Suite Services
- Voice/DTMF Recognition Grammar Services
- Data Access Services

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- Transaction and Session Management
- Thread Pools and Connection Pools
- Distributed Caching
- Application Monitors and Alerts
- Floodgate Messages Integration
- Floodgate Recording Utility
- VXML Support and integration to web framework
- Web Framework based on MVC pattern
- Log generation for traceability and reporting purposes

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The implementation of a Voice Application results in the following main artifacts:

- Dynamic web pages in VXML standard
- Prompt Suite
- Grammar Suite
- Configuration changes

5.3.5 Automatic Speech Recognition Engine

The Automatic Speech Recognition (ASR) engine provides the capability of recognizing an audio stream against a set of recognition grammars and returning the result as defined in the recognition grammar. The ASR engine receives audio streams from the SG and returns the result of recognition back to the SG. The logs are generated by the engine for traceability purposes.

5.3.6 Text-To-Speech Engine

The Text-To-Speech (TTS) engine provides the capability of converting a text string into audio. The engine also provides a dictionary for specifying pronunciations for different words as to how it should be translated into speech. The TTS engine receives the text string from the SG and generates an audio stream or audio file for it. The generated audio stream/file is sent back to the SG.

The Text-To-Speech engine offers offline audio generation tools that allows for testing of text to speech conversions and also audio generation. The engine also generates logs for traceability purposes.

5.3.7 Telephony

The telephony component consists primarily of telephony hardware. At a higher level, it represents the telephone lines coming into the system. There are several different telephony options supported by the platform.

5.3.8 Web Management Console

The Web Management Console provides an administrative tool for the IVR application. It provides access to features in IVR that can be monitored and managed through web interface. The Web Management console gives the customer access to the caller reports. Different parts of the web management console have different access restriction and can only be accessed using authorized accounts.

The web reports contain the following standard reports:

- Call volume and average call duration (over the reporting time).
- What hour during the month had the most calls (peak calls).
- What day of the month had the most calls (peak calls).
- Number of calls not answered.
- Wait time for each call not answered immediately.

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- Number of errors made in the call menu and where the errors occurred (what menu selection the error occurred in).
- Number and percentage of call transfers.
- Number of feedbacks received over the reporting time.
- Number and percentage of category of information reported.
    - Top 10 Highways requested
    - Top 10 City and County requested
    - Top 10 Locations requested

The reports support following options:

- Secure access
- Sorting based on date/time
- Sorting based on telephone number
- Printing reports.
- Saving Reports in electronic form

5.4 Architectural Design

The VoxLinx platform is designed using a multi-tier architecture. There are three tiers in the VoxLinx platform:

- Presentation Tier
- Application Tier
- Data Tier

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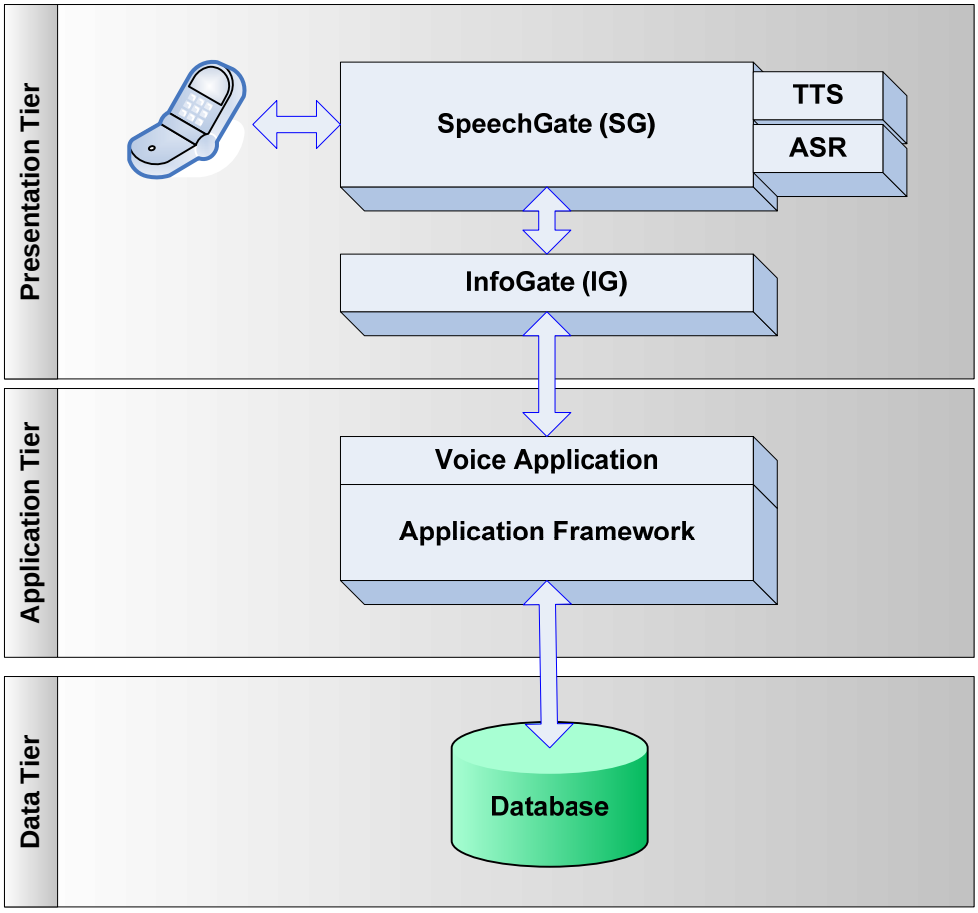

Figure 32: Tier Architecture

The following sections will describe each tier in detail.

5.4.1 Presentation Tier

This tier comprises the actual telephony interface along with presentation-enabling technology, i.e. VoxLinx Core (SpeechGate and InfoGate).

The presentation format is voice and interactions are performed using voice commands and DTMF tones.

5.4.2 Application Tier

The Application Tier consists of a Voice Application which is built on top of the application framework. The application framework inherently supports the building of voice applications based on the VXML standard.

The application framework is essentially an implementation of an MVC pattern. By building on top of this framework, the voice application is centrally focused on the business requirements and application logic specific for a given voice application.

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5.4.3 Data Tier

The data tier comprises different repositories that are used by the application tier. Repositories can be databases, 3rd party data feeds, or properties files that are maintained outside the scope of the application tier.

For consolidation and central access, all data feeds are stored in a central database to reduce the number of interfaces that the application tier will have to use to access the information.

5.4.4 Communication between Tiers

Communication between different tiers is based on standard protocols and formats. The communication between the application tier and the data tier is through standard (java) persistence APIs. For all other communication needs between the application and data tiers, standard SQL language is used.

The VoxLinx Core (SpeechGate and InfoGate) is based on the VXML standard. VXML is a W3C standard for writing voice user interaction dialogs and for creating interactive voice response applications. The flow of information between the presentation tier and application tier complies with the VXML standard. The application tier generates VXML documents for the presentation tier and these documents are exchanged over the standard HTTP protocol.

5.4.5 Physical Architecture

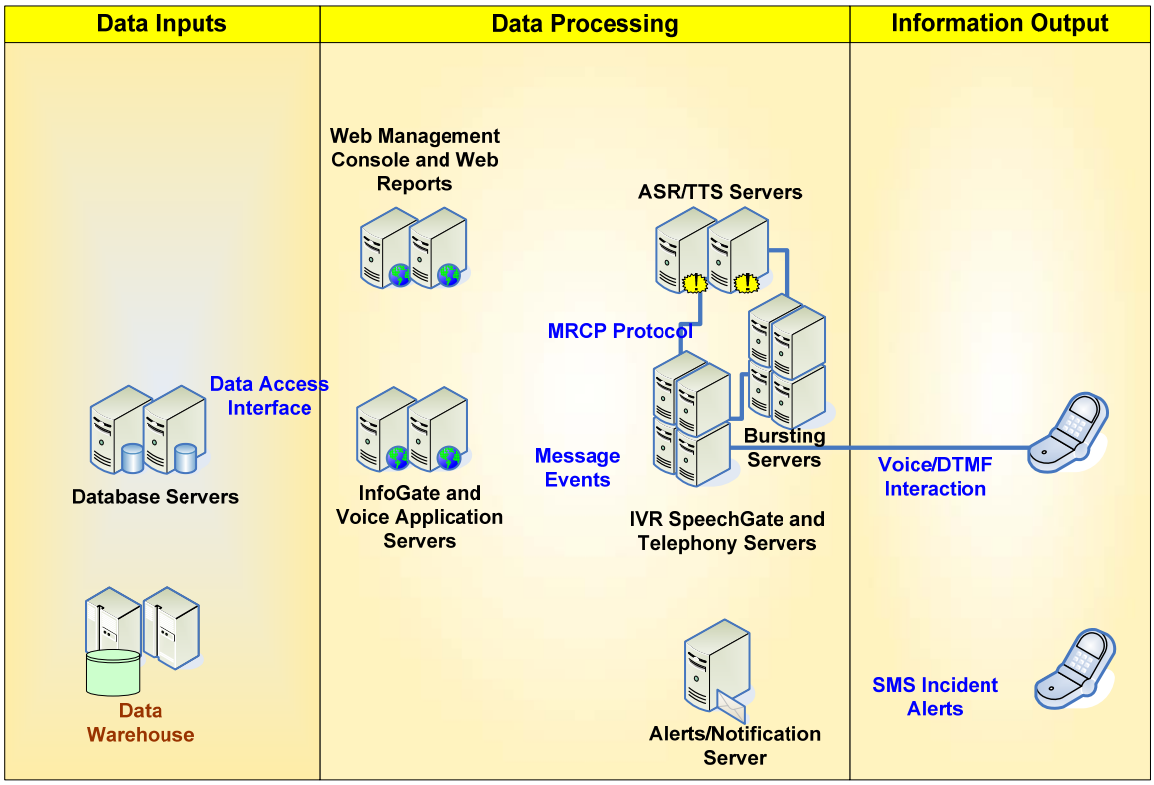

Figure 33- IVR Physical Architecture

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5.4.5.1 InfoGate and Voice Application Servers

Application servers host voice (web) application running under Apache Tomcat 6. The server supports minimum of 400 simultaneous requests and maximum of 5000 simultaneous requests.

The InfoGate and Voice Application are hosted on the same physical server to reduce network traffic and network latency.

5.4.5.2 Telephony Servers

The telephony servers are a farm of SG servers having a total of 400 ASR and TTS ports for the FL-ATIS. Each port is capable of providing both ASR and TTS features. Telephony interface boards are used for integrating telephone lines with the IVR system.

The bursting servers are deployed in addition to the above mentioned 400 ports. The bursting servers support 4000 ports capable of touch-tone interaction only. There is no ASR support on bursting servers.

The telephony lines used with these servers support both toll-free and non-toll-free call transfers.

5.4.5.3 Database Servers

Two database servers are configured in Master-Master Replication. The database servers are configured for automatic failover and recovery.

5.4.5.4 Alerts/Notification Server

The Alerts/Notification server(s) is/are responsible for dispatching SMS alerts to users who have registered for this alert service through their MyFlorida511 personalized account.

5.4.5.5 ASR/TTS Server

ASR and TTS servers are hosted in cluster environment using Nuance License Manager for failover and load balance. Both ASR and TTS capabilities are provided by Nuance.

5.4.5.6 ASR Engine

Nuance 9 is used for automatic speech recognition. The server supports SRGS Recognition Grammar Standard for grammar definitions and MRCP (Media Resource Control Protocol) Protocol for receiving speech recognition request.

5.4.5.7 TTS Engine

Nuance RealSpeak is used for converting text to speech. Nuance RealSpeak supports SSML engine that allows message exchange in MRCP protocol

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5.5 Alternative Architecture for the IVR

This section presents some alternatives to each of the components that currently form part of the IVR design.

5.5.1 InfoGate and Voice Application Servers

- **Current choice:** Apache Tomcat 6
- **Alternative:** JBoss and BEA Weblogic application servers

JBoss and BEA Weblogic application servers were considered as an alternative because they provide some container level features which are useful for our IVR application. However, reason for using Apache Tomcat is that VXML application that we develop is a Web Application and does not require any container level features like persistence, enterprise beans, etc. Furthermore, support for those components is already available in the in-house framework LogicTree currently uses.

5.5.2 Telephony Servers

- **Current Choice:** SG and NMS
- **Alternative:** A combination of Asterisk PBX and a 3rd party VXML/MRCP connector can be an alternative solution.

The Asterisk PBX did not support VXML in which we are using for our application development. Also the Asterisk PBX does not support Voice Recognition through MRCP as a standard feature. If we wanted to include any of those features then we would have to purchase more expensive software in which there was simply no need to do when the SG had all those features as a standard approach. At the same time, moving with new software would mean that we would need to invest some major time in training and testing any kind of a new platform that comes in. Also another capability that the SG had “session persistence” did not exist in Asterisk PBX.

5.5.3 Database Servers

- **Current Choice:** MySQL
- **Alternatives:** Oracle, Postgres SQL

MySQL is widely used in industry and has proven record of large-scale data handling. Compared to alternatives, MySQL provides a lightweight yet reliable database solution which is cost effective and feature rich for IVR needs. MySQL provides different storage engine supports for best utilization based on different criteria’s specially read/write percentages.

5.5.4 Alerts/Notification Server

- **Current SMS Gateway Provider Choice:** CellTrust
- **Other options considered:** In-House SMS Gateway, SMS as Email, Other SMS Gateway Service Providers

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CellTrust was selected after considering several gateway options. The criteria for selection were:

- API integration and Ease of Use
- Product features and offerings
- Future Expansion in volume
- Future Expansion in terms of features
- Reliability
- SMS notifications send/receive delivery receipts

5.5.5 ASR/TTS Server

- **Current Choice:** Nuance 9.0
- **Alternative:** Nuance 8.5's cluster configuration

Based on the latest performance reports from Nuance, Nuance 9 performs better by 18%. At the same time it has an open standard for the communication between third party libraries (MRCP) so it was easier to do any kind of integration on it. We have managed to verify the performance of this new version and the results using Nuance 9 were noticeable. Also Nuance 8 had an end of life sometime in 2011 in which we just didn't want to spend any more time with software that it was getting close of not being supported.

5.5.6 ASR Engine

- **Current Choice:** Nuance 9.0
- **Alternative:** Nuance 8.5 native API

The Nuance 9.0 is using an open based MRCP protocol that is using the latest communication standards such us SIP/RTP. As a result with this new connectivity we have the capability to control the performance of the system in a much closer perspective. The combination of this approach and the improvements that Nuance 9 had on its engine gave us the capability of being able to double the capacity of the simultaneous request on a single server. Also based on Nuance's benchmarks, the recognition quality of this new engine is an overall 18% better than the previous version. Nuance 8.5's native API even though it has been a good alternative in the past deployments, its capability of scaling could never get as good as what this new type of engine can give us.

5.5.7 TTS Engine

- **Current choice:**
- **Alternative:** Vocalizer 4.0 for TTS

Good performance is more of the way TTS sounds and it's a quality of the TTS. When we listened to it, it sounded better than Vocalizer. At the same time, Vocalizer was a dying product. As I was contacting Nuance support for bugs that I found in their TTS

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engine, they said they were not planning on doing any more improvements to it. Instead, they were putting most of their energy into the RealSpeak TTS. Since RealSpeak TTS is now Nuance's main TTS product and since it supports MRCP, which vocalizer does not, and since it supports the most foreign languages available out there, we decided to go with this choice.

5.6 Data Design

5.6.1 Global Data Structures

5.6.1.1 Traffic Events

The IVR application will make use of following information received under traffic events while providing event information to the caller.

- Incident Type (SAE Code)
- Incident Category
- Incident Severity
- Reference Location
    - Road Name
    - Road Direction
    - Cross Street Name and reference-direction
    - Secondary Cross Street Name and reference-direction
    - Exit Number and Exit Suffix
    - Distance between incident and reference location
    - City
    - County
- Incident Details (SAE codes, qualifiers and play out sequence)
- Alternate road information
- Last update time for the event
- Latitude/Longitude (for spatial search)

There are no free form text fields in the above mentioned list. All the fields are pre-defined.

5.6.1.2 Travel Times

The IVR application will make use of following information received under travel time information while providing travel times to the caller.

- Travel Time segment/link Name (providing from and to location information)
- Travel Time in minutes
- Road associated with travel time segment
- Direction associated with travel time segment

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- Reference location association with travel time segment, if available.

NOTE: Based on configuration at the district level, delay times may be provided instead of travel times. However, FDOT has decided not to use delay times for now. Although the delay times feature is available in the system and the IVR supports it, it still needs to be configured in order to have it available to callers.

5.6.1.3 Data Structure Design

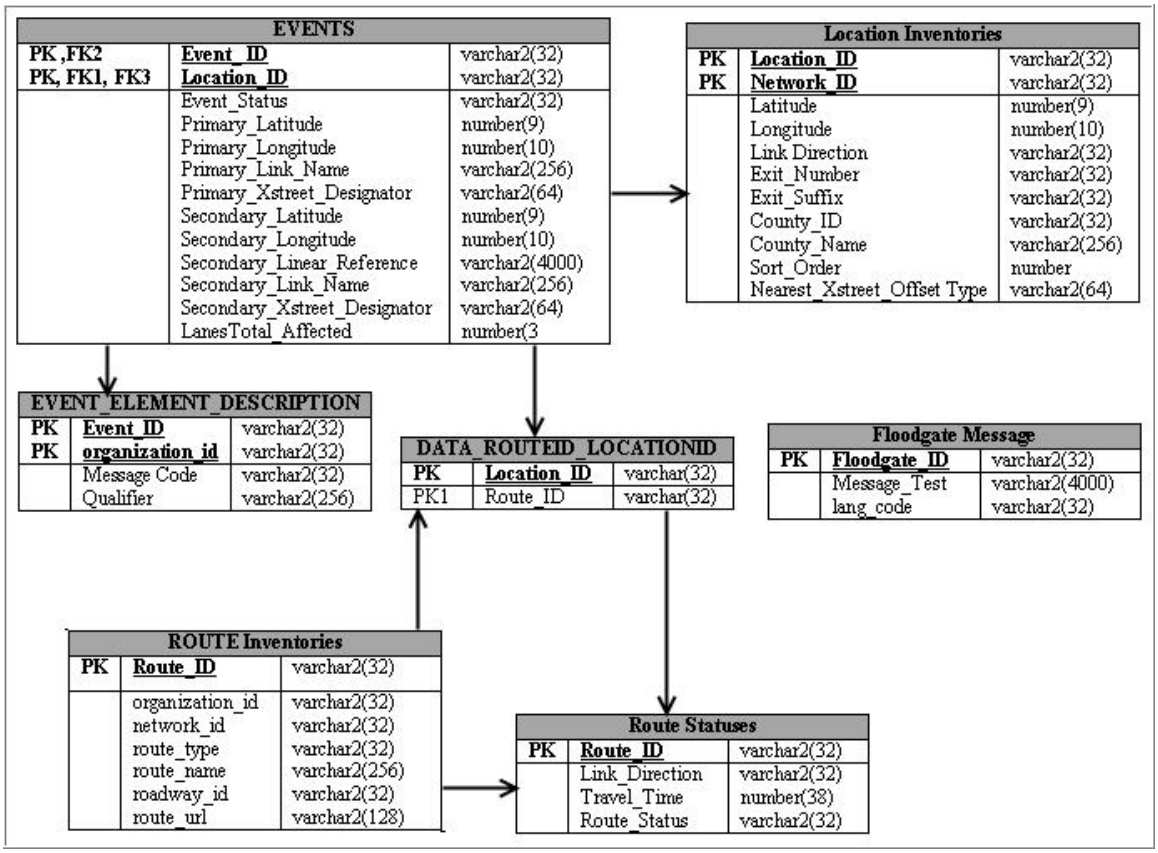

Figure 34: IVR Data Base

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The table displayed below describes the tables used in the IDS database:

Table 3: IVR Database Tables

S. No.	Table Name	Description
1	EVENT_ELEMENTS_DESCRIPTION	This table provides Traffic Reports (as a sequence of codes that can be associated dynamically with audio files) received from Sun Guide system.
2	EVENTS	This table provides additional information on Traffic Events/Incidents.
3	LOCATION INVENTORIES	This table provides information on locations where traffic events/incidents can be reported from Sun Guide.
4	DATA_ROUTEID_LOCATIONID	This table provides information about mapping of route_id and link_id.
5	FLOODGATE MESSAGES	This table provides Floodgate Messages (Audio & Text) received from Sun Guide system.
6	ROUTE INVENTORY	This table provides a list of TVT Links in FLATIS on which Travel Time can be reported.
7	ROUTE STATUS	This table provides travel time and delay information over a TVT Link.

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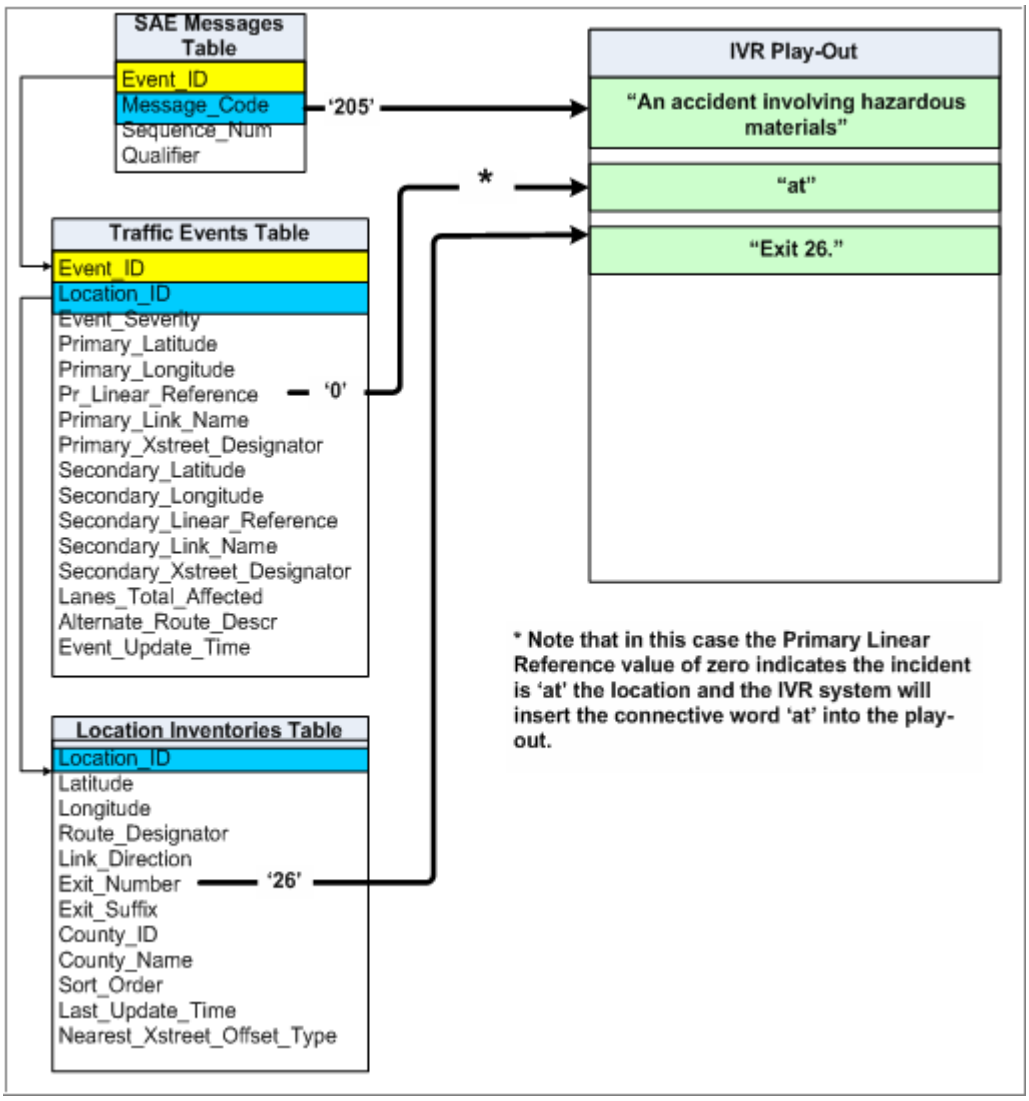

Figure 35: IVR Database Incident Playout Sample No 1

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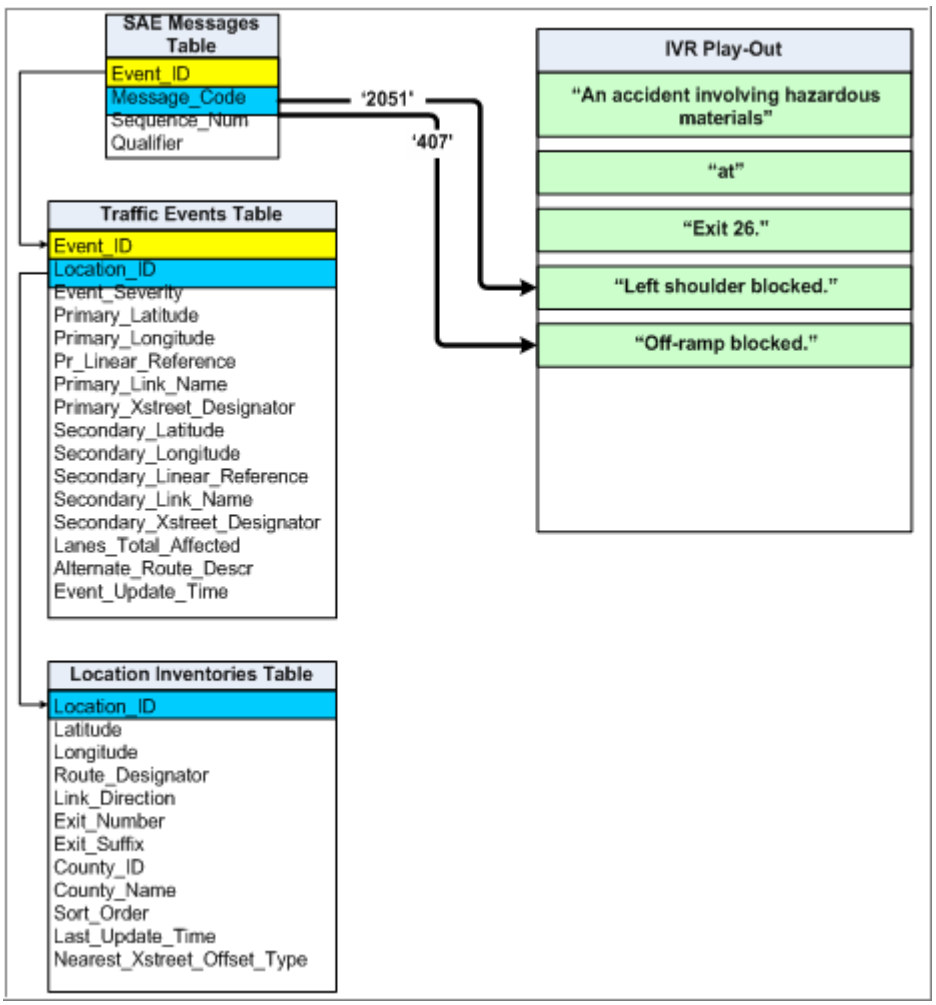

Figure 36: IVR Playout Report Sample No 2

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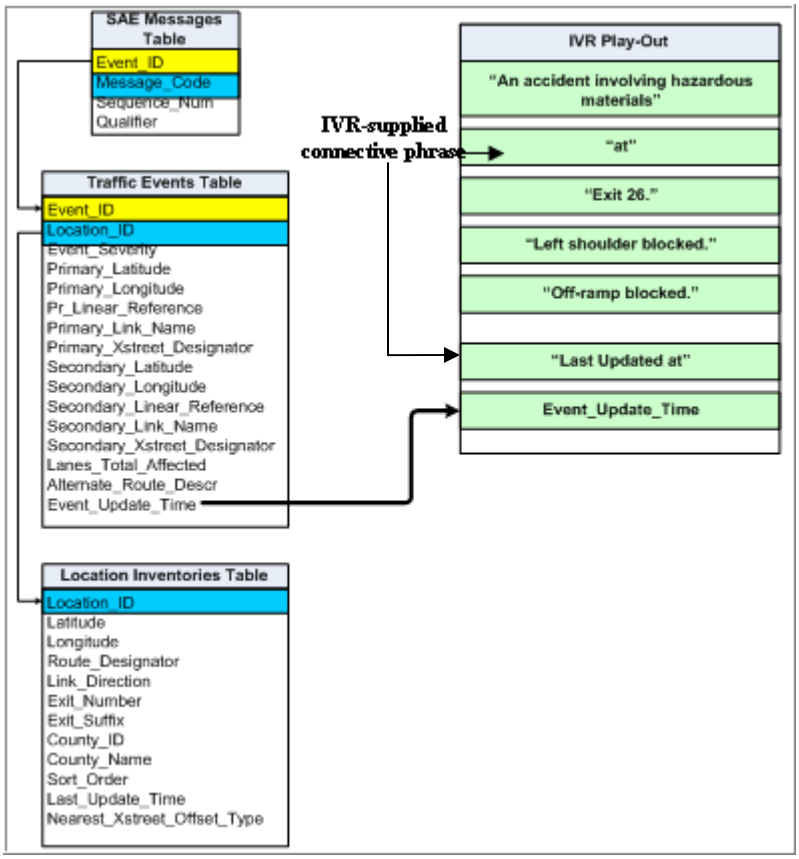

Figure 37: IVR Playout Report Sample No 3

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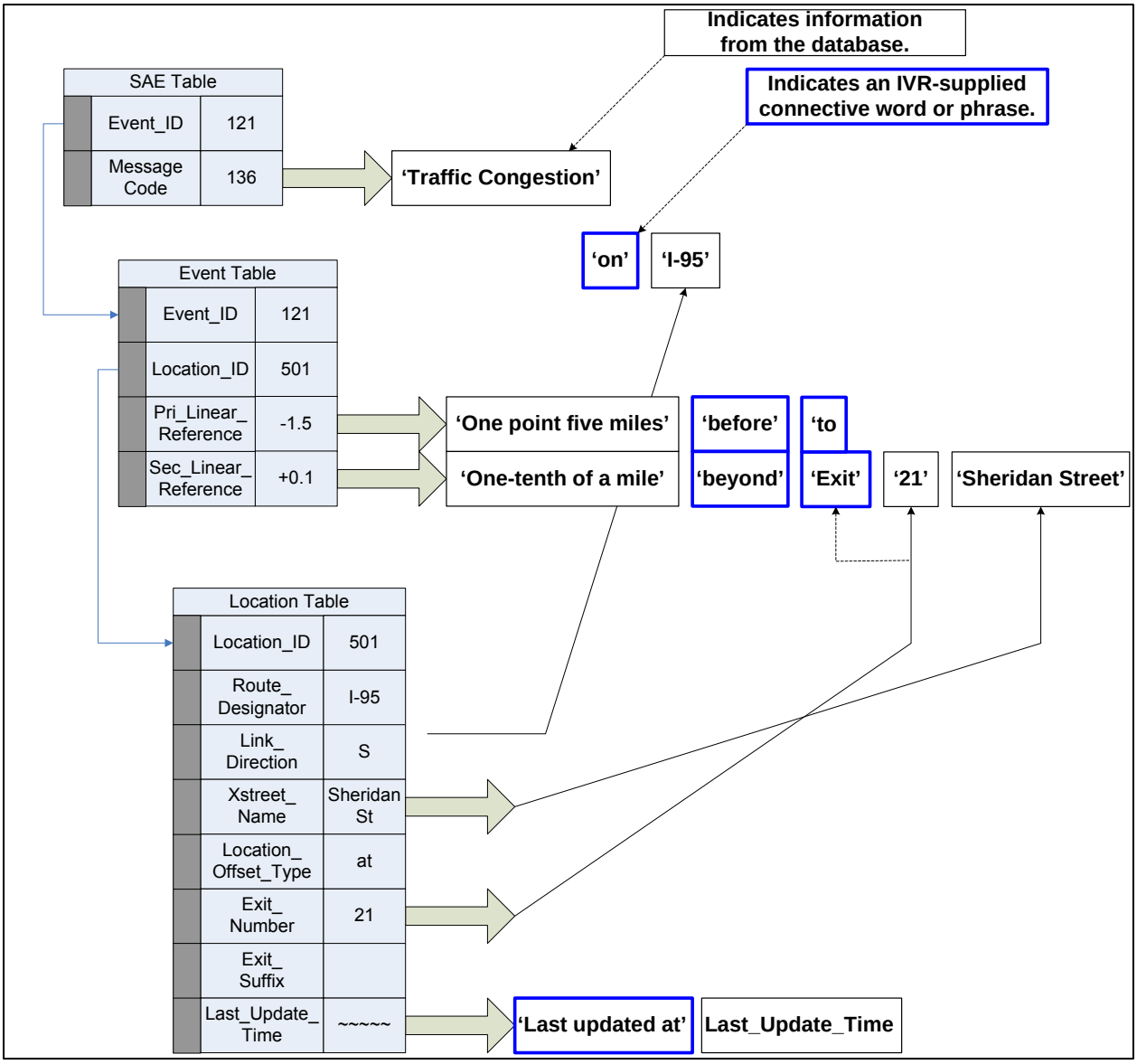

Figure 38: IVR Play out Report Sample No 4

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5.6.1.4 Floodgates

The floodgate messages provide the flexibility of having custom recorded messages played out to the caller. The floodgate messages are defined in the call at various levels and are played to the caller only if a message is available. The system supports the following features for floodgate messages:

- Enable or disable barge-in for a floodgate message.
- Enable or disable call-termination after the floodgate message has been played. When enabled, this allows calls to be terminated automatically after the floodgate message has been played.
- Allow messages in both English and Spanish language.
- Allow the floodgate messages to be entered in text form as well (for Text-To-Speech playouts when a pre-recorded message is not available).
- Allow updates to floodgate messages over C2C. The C2C interface does not provide control over barge-in and call-termination features.
- Allow updates to floodgate messages through the administration website. The administration website allows changes to the barge-in and call-termination options.

Currently, the floodgate messages are provisioned at the following levels:

- Statewide
- Regions
- Counties
- Roadways
- Roadways associated with County.
- Airports
- Seaports
- Transit Agencies

The IVR application will process floodgate messages on a hierarchical basis, presenting these messages to callers at various points in a call cycle. Statewide and region-wide floodgate messages will be played to callers on their entry into the IVR application. If one or more statewide floodgate messages are found to be present at the time a call session is initiated these will be played to the caller. The application will then check for the existence of region-wide floodgate messages. If any such messages exist the caller will be informed of their existence, by region, and asked if they wish to hear any of them. If they do, the message(s) will be played for the caller. When the caller has finished listening to the region-wide floodgate messages normal call flow will continue.

5.6.1.4.1 Floodgate Messages Design

The primary association of floodgate messages will be as follows: an allowance for four (4) floodgate messages per entity, with message entities at the State, Region, County, City, Roadway (as associated with County), Airport, Seaport, and Transit Agency levels.

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While four message slots have been designed for each entity it is anticipated that only one slot will be used with respect to Roadway-and-County. The following table details LogicTree's understanding of the requirements for the number of entries at each entity level and the resulting number of floodgate message slots that will be required.

Table 4: FL-ATIS Floodgate Message Allocations

Entity	Count	Field Req.	No. of Msg. Slots	No. of Slots Required	Restrictions / Comments
State	1	9	4	4	Cannot be zero (0). '1' = State-Level Message; '2' through '9' = Non-State-Level Message.
Region	7	9	4	28	SE, SW, Central, Tampa Bay, NE, Panhandle, and Turnpike
County	67	99	4	268	
City	412	999	4	1,648	City may be restricted to less than the maximum of 412 based on FDOT's decision as to the minimum population floor for which floodgate messages will be considered.
Roadway/ Other	TBD	9999	4	No.-Of-Roadways*67*4+ No._Of_Airports*4+ No._Of-Seaports*4+ No._Of_Transit_Agencies	Allowance is being made for a maximum of 9,999 possible roadways within a county in the eventuality that a county may contain more than 999 roadways.

In order to accommodate the communication of floodgate messages from SunGuide/DFS to the IDS/IVR system, it will be necessary to establish a new floodgate message naming convention. Currently the C2C is defined as passing the floodgate name in a 32-position numeric field (even though the current floodgate message names are alphanumeric). With the revised naming structure as detailed in Table 1, above, and as defined below, a 32-position alphanumeric field for floodgate names will be more than sufficient.

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5.6.1.4.2 Floodgate Message Naming structure:

Floodgate Message Names will be constructed as dot-separated numeric elements as per the table above. The following is the Floodgate Message Name structure proposed:

State.Region.County.City.Roadway_Other.Message_Slot_Number

And with element definitions of

9.9.99.999.9999.9

The State field must be non-zero and a value of '1' indicates a State-Level Floodgate Message, and the Message_Slot_Number must be a value of between 1 and 4, inclusive. The remaining field values will be defined by a mutually-agreed-upon set of values (e.g. in a spreadsheet or other document) so that SWRI may set the values accordingly within the SunGuide system and LogicTree/IBI will associate those values with the appropriate Floodgate Messages.

If the State field has a value of '1' then all of the remaining fields of the floodgate message name will be ignored and masked to zero to create the Floodgate Message Name. If the State field has a non-zero value not equal to '1' then it will be masked to a value of '2' and the remainder of the name-string will be interrogated.

If the Roadway_Other field is non-zero, then the IVR system will mask to zero all of the message-string fields with the exception of the State, County, Roadway_Other, and Message_Slot_Number fields in order to retrieve the floodgate message.

To code a floodgate message for other than State and Roadway, all fields not required, other than State and Message_Slot_Number, should contain the valid level of information.

For example:

State-level Message Name:	1.0.00.000.0000.[1-4]
Region-level Message Name:	2.[1-8].00.000.0000.[1-4]
County-level Message Name:	2.[1-8].[1-nn].000.0000.[1-4]
City-level Message Name:	2.[1-8].[1-nn].[1-nnnn].0000.[1-4]
Roadway-level Message Name:	2.[0].[1-nn].[000].[1-9999].[1-4]

FDOT has provided the numerically coded list of counties and this has been used to build the model spreadsheet of Floodgate Message Code Data by LogicTree. Please refer to Appendix 10.3 for details on this spreadsheet.

5.6.1.5 Rest Areas

If caller requests rest area information the system will present all rest area information for a distance of forty (40) miles from the caller's stated location of interest. This distance will be based on both the caller's location of interest and direction of travel. If

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either or both of these pieces of information are not available to the application when the caller requests rest area information the application will prompt the caller to provide it.

The IVR will provide the Rest Areas information contained in the spreadsheet "Rest Area Listings for FLATIS v6.xls"[1]. Based on the highway and exit number, mile marker or county given by the caller, the system will readout the info contained in the field "Description of Location" and the amenities found at the particular rest stop. Following is a sample report:" Rest stop 1. 6 miles west of SR 10 near exit 324. Amenities include: rest rooms, phones, picnic tables, vending machines, pet walk, handicap facilities and 24 hour security."

5.6.2 Reference Data

In order to provide incident details to callers and to recognize caller request regarding incidents and travel time, reference data is required to produce pre-recorded audio files and voice recognition grammars.

Following reference data is used for producing pre-recorded audio files:

- Roadway Names
- Road Direction
- Cross Street Names
- City Names
- County Names
- Region Names
- Travel Time Segment Names
- Exit Numbers and Mile Markers
- Incident Details (SAE codes, qualifiers).
- Alternate Road information
- Rest Area information
- The following data is used for generating voice recognition grammars:
- Roadway Names and aliases
- City Names and aliases
- County Names and aliases
- Cross Street Names and aliases
- Exit Numbers and Mile Markers
- Travel Time Segment Names and aliases

[1] spreadsheet was provided by FDOT.

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5.6.3 Data Mappings

In order to play incident information in concatenated speech, relationship between the pre-recorded audio files, the recognition results and the real-time incident data coming into IDS needs to be defined. The best approach is to define a unique key that can bind the following three pieces of information together:

- Pre-recorded audio files
- Grammar recognition results
- Incident and travel time data in IDS

For consistency and efficiency, the unique IDs part of data in IDS database is used as data mapping ID.

The following fields from section 5.6.2 need to have unique ID associated with it in order to define data mappings to pre-recorded audio files and recognition grammars.

Reference Data	Mapping details
Incident Details	Incident Details are received as SAE codes. The mapping is defined using the standard SAE codes.
Roadway Name	Unique roadway identifier that will be received as part of traffic event information
Road Direction	Pre-defined text values for all possible directions that will be used as unique identifier. This text will be received as part of traffic event information.
Cross Street Name and reference-direction	Unique cross street name identifier that will be received as part of traffic event information (in-place-of/in-addition-to cross street name).
Secondary Cross Street Name and reference-direction	Unique cross street name identifier that will be received as part of traffic event information (in-place-of/in-addition-to secondary cross street name).
Alternate Road	Pre-defined text values that will be used as unique identifier. This text will be received as part of traffic event information
Travel Time Segment names	Unique travel time segment (link) identifier that will be received as part of travel time information.
Offset Distance	Indicates a reference distance from where the event has happened. If linear reference is zero, IVR will play nothing. If linear reference is non-zero, plays "before" if value is "-" or plays "beyond" if value is "+", Offset distance is handed on Event Table Primary and Secondary Linear Reference.

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5.6.4 Functional

5.6.4.1 Dynamic Segments

When a caller requests for information near a specified location, the system will search for all incident around that area based on given traversal distance. The application performs a spatial search on the reference locations using the latitude and longitude of the caller-specified location to find all the other reference locations in vicinity. Once that list is received, application checks if any of those locations have any incidents reported on it.

The search is restricted to the highway on which the caller-specified reference location is defined. All other highways and reference locations in the traversal distance are ignored in the spatial search.

Based on the approved design from the spiral reviews, IVR will not ask for a direction of travel if the caller requests incident reports. However, while playing the traffic report the IVR will consider the direction if the callers mention the direction when requesting a traffic report, for example “I 95 north”.

The search will provide minimum coverage as defined by the traversal distance. If the road has curves or it is a winding road, it might cover more reference locations within the same traversal distance.

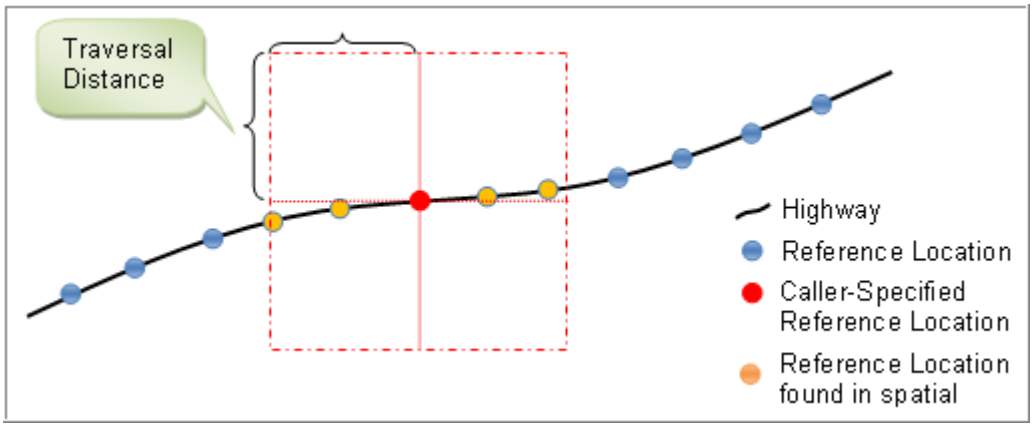

Figure 39: Traversal Distance

5.6.4.2 Incident Report

Incident reports will be played out to callers based on the specific level of interest they have declared to the application: county, roadway, or location on roadway. The IVR application will query the IDS database for incident information appropriate to the caller’s level of interest and will then play out any incident information to the caller. All incident reports will be assembled from pre-recorded speech segments, using the appropriate connecting phrases, based on the incident information retrieved from the database. For this concatenation process, the system uses the mapping IDs in the event information to find the related pre-recorded audio files.

Following example of incident report, Traffic Congestion on an entire roadway, shows detailed information on the concatenation process and the underlying data structures used by the IVR. Phrases that need to be concatenated are in square brackets and the reference to the EM codes and database table fields are in parentheses.

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Table 5: Incident Report - Traffic Congestion on entire Roadway

Report on Traffic Congestion on an entire roadway	
Phrases	**Reference to EM Codes & Data tables**
[Traffic congestion]	(EM code 136 (in sequencing spreadsheet))
[State Road 417]	(NODE_INVENTORIES.NODE_ROUTE_DESIGNATOR)
[northbound]	(NODE_INVENTORIES.NODE_DIRECTION)
[from]	(2b. connecting phraseology (in sequencing spreadsheet))
[exit 38, Aloma Avenue]	(3. Read-out EM location information...)
[to]	(4. connecting phraseology)
[exit 44, State Road 434]	(3. Read-out EM location information...)
[Right lane closed]	(7. Lane Closure, EM code 507)
[Suggested alternate road]	(8. connecting phraseology)
[I-4]	(Read-out Alternate Road Information)
[Last updated]	(10. connecting phraseology)
[at 10 am]	(Read-out Event Time Stamp)
Report readout: *"Report 1. Traffic congestion. State Road 417 northbound. From exit 38, Aloma Avenue to exit 44, State Road 434. Right lane closed. Suggested alternate road: I-4. Last updated at 10 am."*	

Refer Incident Report Examples in the Appendix for more examples of incident reports and their reference to the EM codes and table fields.

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5.6.4.3 *Personalization*

When the system receives an incoming call, the caller's phone number is retrieved from call record's ANI information. This phone number is used to search the repository to find if there are any personalized accounts associated with the number. If an account is found, the caller is taken to the personalized reporting section where the caller can listen to incident and travel time reports on their pre-defined routes.

If the number is not found in the records, the system continues the call as a regular caller.

5.6.4.4 *Integration with IDS*

Data from IDS is replicated to a local database (Data base server on Figure 39 for IVR reporting purposes. Event notifications are received from the IDS via a web service that notifies which information has been updated in the IDS database. This removes the latency that is caused by a polling process and allows a more efficient use of network and database resources. The local database has failover and back-up processes in place.

5.7 Human Interface Design

The Human Interface Design provides an overview of the design considerations and specifics of the voice user interface. The interaction with the IVR application is consistent across the whole state and callers from any part of the state will interact with the same IVR application.

5.7.1 Design Considerations

5.7.1.1 *Voice interaction*

The system is designed to allow callers to interact with the system using phrases and keywords to make it more conversational-based.

5.7.1.2 *Touch Tone interaction*

The system will provide a touch tone feature as a backup to voice input. The touch tone input mode is allowed in all dialog states by default and a caller can choose at any time to switch to touch-tone mode.

Usually, touch tone mode is supported throughout the application as a secondary mode of input along with voice. However, the system will also allow callers to go back to voice mode at any time they choose if they explicitly choose to interact in touch tone mode.

5.7.1.3 *Pre-Recorded Audio*

Pre recorded text will be used for all menu prompts in the application as well as the reference data as defined in section 5.6.2.

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5.7.1.4 Universal Grammars

The Universal Actions grammar will be active at almost every point in the dialog. This grammar is typically used to allow callers to ask for help, repeat prompts, or get to the main menu. The universal actions and the associated sample expressions used in this application are shown in the table below. Users will be informed about some of the most commonly used universal commands when entering the system. Other universal commands will only be played if the caller seems to be in need of them, but will be active throughout the call. For instance, in the error behavior the caller will hear that he or she can ask for help at any time, because help is what the caller may need at this point. Likewise, the caller only hears about the goodbye universal in the parts of the system where the user will typically have completed his or her task and may wish to leave the system.

Table 6: Universal Grammar - Sample Expression

Universal Grammar	Sample expression
Help	“help”
	"I need help please"
	"what are my choices?"
	"what can I say?"
	“I don’t know”
	* (DTMF)
Operator	"operator"
	“can I speak to a live agent”
	0 (DTMF)
Repeat	"repeat"
	“again”
	00 (DTMF)
main_menu	“main menu”
	“go to the main menu”
	“Go back to the main menu”
	“start over”

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	"six six"
	66 (DTMF)
touchtone_speech_ switch	88 (DTMF)
Goodbye	"goodbye", "bye"
	99 (DTMF)
Feedback	# (DTMF)
	"feedback", "I'd like to leave feedback"
Profile	"Profile"
	72 (DTMF)
go_back	"Go back"

5.7.1.5 Disambiguation

If a user request has several possible meanings or interpretations the system will present the user with the different possibilities and ask him or her to choose one. In this system the caller may be asked to choose between up to five possibilities, which should be the maximum number of ambiguous items returned by the recognizer. This number can tuned based on post deployment data evaluation.

5.7.1.6 Concatenated Speech

For playing real-time information, the system will make use of pre-recorded segments to play information to callers as concatenated speech. The application is designed to play concatenated speech at least 90% of the time, while using Text to Speech only as a backup in the rare cases where information is not available as pre-recorded text.

The system sends notification alerts to the LogicTree Operations and Maintenance teams in cases where information is played in text-to-speech so that proper action can be taken and pre-recorded audio files can be provided.

5.7.1.6.1 Playing Traffic Report with Concatenated Speech

This section presents an example of a travel time report, but doesn't include all the different possibilities for concatenated speech as there are an extensive number of possibilities. For more information on the report structure and concatenation rules, please refer E&M Source Sequencing in Appendix.

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2Sample Report: "Report 1. Traffic congestion. State Road 417 northbound. From exit 38, Aloma Avenue to exit 44, State Road 434. Right lane closed. Suggested alternate road: I-4. Last updated at 10 am."

Phrases that need to be concatenated for this report are in square brackets and the reference to the EM codes and database table fields are in parentheses

Report on Traffic Congestion on an entire roadway	
Phrases	**Reference to EM Codes & Data tables**
[Traffic congestion]	(EM code 136 (in sequencing spreadsheet))
[State Road 417]	(NODE_INVENTORIES.NODE_ROUTE_DESIGNATOR)
[northbound]	(NODE_INVENTORIES.NODE_DIRECTION)
[from]	(2b. connecting phraseology (in sequencing spreadsheet))
[exit 38, Aloma Avenue]	(3. Read-out EM location information...)
[to]	(4. connecting phraseology)
[exit 44, State Road 434]	(3. Read-out EM location information...)
[Right lane closed]	(7. Lane Closure, EM code 507)
[Suggested alternate road]	(8. connecting phraseology)
[I-4]	(Read-out Alternate Road Information)
[Last updated]	(10. connecting phraseology)
[at 10 am]	(Read-out Event Time Stamp)
Report readout: *"Report 1. Traffic congestion. State Road 417 northbound. From exit 38, Aloma Avenue to exit 44, State Road 434. Right lane closed. Suggested alternate road: I-4. Last updated at 10 am."*	

5.7.1.7 Text-to-Speech

Text to Speech is only used as a back up. This is to ensure that in cases where the pre-recorded audio file is not available, the caller is still able to interact with the system.

[2] Dialog Specification – Florida's 511 Traveler Information System.

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When the wave file is suddenly not available to the system, the IVR will use TTS as backup.

5.7.1.8 Multi-Lingual dialogs

This capability provides the same dialog to callers but in different languages. The same level of access to information and same level of detail in information is provided to all callers regardless of the language chosen by the caller - the pre-recorded audio and Text-To-Speech is available in both English and Spanish and information is played in a specific language based on the current language preference of the caller. It is the intent that the FL-ATIS IVR application will be provided in English and Spanish, with Spanish being selectable by the caller at the IVR Main Menu.

5.7.1.9 Call Transfers

Callers will be transferred to other agencies at their request, and calls will be transferred to the numbers configured in the system. All call transfers will be attended transfers.

5.7.1.10 Adaptive Error Handling

The system will perform adaptive error handling within the context of each dialog state. Error prompts will provide additional information with every timeout and/or misrecognition in order to help the caller through the current state.

Most commonly, the error prompts notify callers that they can also provide input using touch tone mode.

5.7.1.11 Context Sensitive Help

The system will provide detailed help within the context of each dialog state.

5.7.1.12 Shortcuts and the minimization of menu navigation

The system is designed in such a way that the user will be able to retrieve the requested information as efficiently and rapidly as possible without loss of usability. The caller will be able to complete his or her task by navigating only a few menus. The design favors both experienced users and novices. The prompts are clear and provide the guidance needed to use the system without any previous experience. At the same time, the design allows experienced users to skip intermediate steps and go directly to the service feature needed by using “short-cuts”.

A short-cut is an option characterized by not being explicitly mentioned in a particular menu. Frequent users exploring the system functionality will find out about these “hidden options” and utilize them. Examples of short-cuts are found in the main menu. The number of options listed in this menu is kept low to create a user-friendly menu structure and to avoid crossing the threshold of the average human short-term memory capacity. However, the actual number of options included in this state is higher than revealed in the prompt. In fact the grammars for all covered roadways, counties and cities are included, thus allowing the caller to say the location of interest right away, although this option is not explicitly included in the main menu prompt.

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5.7.1.13 Barge-in

Barge-in is the ability of the system to recognize that a caller is speaking while a prompt is still playing, and to stop playing the prompt. Barge-in enables faster service for experienced callers who can interrupt prompts and quickly go through the dialog. Less-experienced callers are still guided by full prompts.

5.7.1.14 Traffic Reports

If there is more than one traffic report for the location chosen by a caller, the reports will be played in a prioritized order: incident reports first, then congestion, and finally construction. Reporting of incidents will be done in a hierarchical manner as follows:

All relevant incidents will be sorted by:

1. Severity
    a. Critical
    b. Major
    c. Minor
2. Roadway Type
    a. Interstate
    b. US Highway
    c. State Road
    d. County Road
3. Roadway Number (in ascending order)
4. Directionality of roadway at incident location (N/S/E/W)
5. EM Location by mile marker from beginning of roadway segment

When one or more incidents have been identified they are selected by Severity, Roadway Type, and Roadway Number, e.g. I-75. They are then played out for the caller in sequence from south-to-north or west-to-east, depending on the roadway, from the beginning of the appropriate roadway segment. Once the south-to-north or west-to-east segment has been completed, incidents will be played out in the reverse direction for that segment.

Here is an example. Let us say that the following incidents are available:

Severity of Incident	**Type of Road**	**Road #**	**Road Side (N/S/E/W)**	**Loc'n. (M/M)**
Critical	US Highway	15	E	12
Critical	State Road	37	E	27
Critical	US Highway	2	W	6
Major	Interstate	10	N	43
Major	Interstate	10	S	45

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Major	County Road	40	W	17
Major	State Road	1	N	22
Major	County Road	10	E	12
Minor	State Road	37	E	15
Minor	Interstate	10	N	36

Note: The Mile Markers (M/M) given for these examples are in the direction of travel from the beginning point of the pertinent roadway segment and not necessarily the actual Roadway Mile Markers. Incident information is for roadway segments as defined by the user's request for information, i.e. at the Roadway, County, City, or Roadway_by_Location level.

Given the above incident information, the incidents will be played in the following order:

Road	**Severity**	**Road Side**	**M/M**
US 2	Critical Incident	WB	6
US 15	Critical Incident	EB	12
SR 37	Minor Incident	EB	15
"	Critical Incident	EB	27
I-10	Minor Incident	NB	36
"	Major Incident	NB	43
"	Major Incident	SB	45
SR 1	Major Incident	NB	22
CR 10	Major Incident	EB	12
CR 40	Major Incident	WB	17

5.7.1.15 Severity and readout order

Please refer to the section above.

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5.7.1.16 N-Best Lists

In cases where the system is not confident about the response it has received from the caller, the system compiles a list of responses that are possible matches. This list is called and N-Best List. The IVR application makes use of this list to disambiguate caller responses from the available options and to discard those entries which are incorrect. During the disambiguation process, the options presented to the caller are marked so that if the caller rejects the option, the system will not ask for that option again.

5.7.1.17 Personalization

For personalization, callers will be identified based on the telephone number they are calling from. If the caller has a personalized account associated with that number, the caller is taken to the personalized reporting section where they can listen to incident and travel time reports on their pre-defined routes.

If the number is not found in the records, the system assumes it is a non-registered caller and continues the call at the main menu. In the main menu, the caller has the option of accessing their personalized account by requesting a profile check and providing their valid registered phone number.

5.7.1.18 TTYD Support

The 511 services will be available to the hearing-impaired through the 711 relay services that have been established to enable the hearing-impaired to call any phone number, regardless of whether it is TDD-TTY-equipped. LogicTree will work with the 711 Relay Service providers in Florida to allow them access to the back-door (toll-free number) so hearing impaired users may dial 711 and request information from the 511 system3.

The Florida Relay Service is the communications link for people who are Deaf, Hard of Hearing, Deaf/Blind, or Speech Impaired4. Through this service, people who use specialized telephone equipment will be able to request information from the 511 system.

5.7.1.19 Tuning

The system tuning will begin the day of system go-live and continue for 60 days after go-live. This will be followed by a system update scheduled. This is in addition to the grammar tuning that is a part of recognition testing.

During the post deployment tuning and monitoring services, LogicTree will use the detailed call reporting system to analyze recorded call data and determine the in-grammar accuracy, out-of-grammar call rate, and in-grammar call rates. Engineers and designers will also look at each call and determine prompts, menus, etc where instances of misunderstandings or inefficiencies are occurring in the IVR component.

[3]This statement satisfies the FL-ATIS Requirement ID031V and was approved by FDOT during IVR Requirements Review Meeting.
[4] Florida Telecommunications Relay, Inc. http://www.ftri.org/index.cfm/go/public.view/page/3

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The following metrics will be analyzed in detailed during the tuning process:

- Application Performance – The application performance tells what percentage of callers was able to get the information they requested for. It also indicates which information was most often requested. This can provide invaluable insight for future enhancements.
- Recognition Rate – The Recognition Rate Analysis is based on the number of caller responses the system was able to interpret, as well as the system's positive confirmation rate. This can help identify places where a grammar needs to include a different phrase or pronunciation, as well as prompts that do not elicit the intended responses.
- Rejected Responses – The Rejected Response Analysis reveals the reasons behind responses that were not recognized by the system. This analysis gives an idea whether the prompts are clear, or whether the system's misrecognitions are due to audio input problems, among other reasons.
- Customer Feedback – Callers/Users are given the opportunity to leave feedback regarding the system. Here they can request for additional features, provide feedback on liking or disliking of the system, etc. LogicTree will analyze these comments and determine which features would be good additions for future versions of the system.

5.7.1.20 Feedback

The caller has an option to leave feedback about the system functionality, usage and to report traffic incidents he/she didn't hear about. The design specifies two states in which the callers can leave feedback.

- Before the caller leaves the system, the IVR asks the caller if he/she would like to leave feedback.
- If the caller has asked to leave information, he/she is asked to choose between leaving general feedback about the system or report traffic conditions.

If the caller selects Traffic Conditions, then the caller is prompted to provide information on reported traffic conditions. If the callers select "general information", the IVR prompts them to provide feedback on their overall experience about the system.

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5.7.2 Use Cases

The Use Cases provide specific examples of caller interactions and system-provided information in response to the dialog with the caller. These Use Cases serve to illustrate the most common interactions between the caller and the system, and provide a feel for how the application will sound and function.

5.7.2.1 Samples of Use Cases:

5.7.2.1.1 User is calling and there is a Region floodgate message.

Sample dialog: (Start of call)

System: "You've reached Florida's SunGuide Traveler Information System, brought to you by the Florida Department of Transportation."

System: "For English please remain on the line. Para Español, diga 'Español' o marque el dos."

Caller: [remains quite].

System:" I have very important information for Southwest Florida. Is this the region you're calling from?"

Caller: "Yes"

System: "Travelers in Southwest Florida need to be aware that there is a category 5 hurricane approaching Florida from the Gulf of Mexico. This storm is expected to make landfall somewhere between Key West and the Tampa/Saint Petersburg area within the next 36 to 48 hours. Please check with NOAA Weather Radio and your local television and radio stations for further information, including possible evacuation instructions for your area."

System: *(Takes the caller to the main menu or hangs, up depending on the settings)*

5.7.2.1.2 Caller requests traffic information for an entire roadway and then requests travel time reports for the same roadway

Sample dialog: *(Welcome prompt and choose language prompt omitted)*

System: "Say 'main menu' to return to this menu. Press '88' at any time to switch to 'touch tone' mode. Now, do you want information about 'traffic', 'public transit', 'airports and seaports', 'other transportation' or 'other services'?"

Caller: "Traffic."

System: "Which city, metro area, county or roadway would you like information for?"

Caller: "State Road 417"

System: "Okay. Tell me a cross street, city or county, and I'll get reports near there. Or to hear all the reports for that roadway, say 'all reports'."

Caller: "All reports, please."

System: "To skip a report, say 'next'. To hear a report again, say 'repeat'. To hear the previous report, say previous. Or to stop listening to the reports, say 'stop'. "

System: "Report 1. Traffic congestion. State Road 417 northbound. From exit 38, Aloma Avenue to exit 44, State Road 434. Right lane closed. Suggested alternate road: I-4.

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Last updated at 10 am. Report 2. Accident, State Road 417 southbound. At exit 50, US 17-92. Off-ramp closed. Last updated at 9 am. Report 3. Road construction, State Road 417 southbound. 1 mile before State Road 408. Express lane closed. Last updated at 11 am."

System: Those are all the reports

System: "Do you want to hear the reports again?"

Caller: "No."

System: "Would you like me to check if there is available travel time information on State Road 417?"

Caller: "Yeah."

System: "Okay, I see that travel time information is available."

System: "Do you want to hear about the northbound or southbound direction of the road?"

Caller: "Uh, northbound."

System: There are 6 sections of State Road 417 for which travel times are available. I'm going to start reading a list of these sections now. When you hear the one want you want, just say it back to me, or if you want all sections, say 'all'. Okay, here are the sections: Section 1, from Interstate-4 (Osceola County) to State Road 528. Section 2, from State Road 528 to State Road 408. Section 3, from State Road 408 to Interstate-4 (Seminole County). Section 4, from Exit 38 Aloma Avenue, State Road 426 to Exit 44 State Road 434. Section 5, from Exit 44 State Road 434 to Exit 50 US 17-92. Or section 6, from Exit 50 US 17-92 to I-4".

Caller: "The third one."

System: "From State Road 408 to Interstate-4 (Seminole County) current travel time is approximately 10 minutes. Would you like to hear that again? "

Caller: "No."

System: "Okay, say the name of the city, metro area, county or roadway you would like information for, or say 'main menu' for other options. If you are finished, you can also say 'goodbye'."

(Caller hangs up)

5.7.2.1.3 Caller requests traffic information for one location on an interstate

Sample dialog: *(Initial prompts omitted)*

System: "Which city, metro area, county or roadway would you like information for?"

Caller: "I-75"

System: "Okay. Tell me an exit, mile marker, city or county, and I'll get reports near there. Or if you want to hear all the reports for that roadway, say 'all reports'."

Caller: "Exit 5."

System: "Disabled vehicle, US-75 southbound. 2 miles beyond exit 55. Left lane blocked. Last updated at 1 pm."

System: Those are all the reports

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System: “Do you want to hear the report again?”

Caller: “No.”

System: "Would you like me to check if there is available travel time information on I-75?”

Caller: “No thanks.”

System: "If you want to hear about another part of the same road, tell me an exit, mile marker, city or county, and I'll get reports near there. To hear about another road, say the name of the road you want. Or you can ask for the main menu at any time.”

Caller: “Main menu.”

(Caller is taken to the main menu)

5.7.2.1.4 Caller requests traffic information for an entire city and then requests travel time reports for that city

Sample dialog: (initial prompts omitted)

System: “Which city, metro area, county or roadway would you like information for?”

Caller: “Miramar.”

System: “There are three incidents in or near Miramar. There is one incident on I-75**.** There are two incidents on Florida's Turnpike. Say 'all reports' to hear all the reports. Or say the name of one of these roads to hear the reports for just that road. If you're done here, say 'main menu'.”

Caller: “All reports”

System: “To skip a report, say 'next'. To hear a report again, say 'repeat‘. To hear the previous report, say previous. Or to stop listening to the reports, say 'stop'.”

System: “Report 1. Weather event due to flooding, I-75 northbound. 1 mile before exit 7A, Miramar Parkway east. 2 right lanes blocked. Suggested alternate road: Florida’s Turnpike Homestead Extension. Last updated at 2 am. Report 2. Accident involving bus, Florida’s Turnpike southbound. At exit 47, Northwest 27th Avenue. On-ramp right lane blocked. Last updated at 5 am. Report 3. Object on roadway, Florida’s Turnpike northbound. At Miramar Toll Plaza. 2 left lanes blocked. Last updated at 1 am.”

System: Those are all the reports

System: “Do you want to hear the reports again?”

Caller: “No.”

Sample dialog: (caller heard traffic reports for information for Miramar)

System: “Would you like to hear travel times for one of these roads?”

Caller: “Yes, Florida’s Turnpike.”

System: "Do you want to hear about the northbound or southbound direction of the road?”

Caller: “Northbound.”

System: There are 2 sections of Florida’s Turnpike for which travel times are available. I’m going to start reading a list of these sections now. When you hear the one want you want, just say it back to me, or if you want all sections, say ’all’. Okay, here are the

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sections: Section 1, from US 192/US 441 to I-4. Or section 2, from Interstate-4 to West Colonial Drive/State Road 50."

Caller: "all"

System: "From US 192/US 441 to I-4 current travel time is approximately 11 minutes. From Interstate-4 to West Colonial Drive/State Road 50 current travel time is 15 minutes."

System: "Those are all the reports."

System: "Would you like to hear the travel time reports again? "

Caller: "No"

(Caller is hanging up)

5.7.2.1.5 Caller requests traffic information for a highway within a county and then chooses not to hear travel time reports

Sample dialog: *(initial prompts omitted)*

System: "Which city, metro area, county or roadway would you like information for?"

Caller: "Broward."

System: "There are two incidents in or near Broward County. There is one incident on I-75, and one incident on I-95. Say 'all reports' to hear all the reports. Or say the name of one of these roads to hear the reports for just that road. If you're done here, say 'main menu'."

Caller: "I-95"

System: "Vehicle on fire, I-95 northbound. 2 miles beyond exit 38, Copans Road. Right lanes blocked. Last updated at 11 pm."

System: Those are all the reports

System: "Do you want to hear the report again?"

Caller: "No."

System: "Would you like me to check if there is available travel time information on I-95?"

Caller: "No thanks"

System: "If you want to hear about another part of the same road, tell me an exit, mile marker, city or county, and I'll get reports near there. To hear about another road, say the name of the road you want. Or you can ask for the main menu at any time. <2 seconds> If you are finished here, you can give us feedback, or say 'goodbye'."

Caller: "Goodbye"

(Caller is taken to Leave Feedback state)

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5.7.3 Call Flows

The call flows provide a graphical representation of the dialog flow and display high-level functionality as well as system prompts and caller utterance samples. They document the specific process flow of the application throughout the various states of a caller's interaction with the IVR application. See document "IVR Call Flows – Version 4.3" for these detailed call flow diagrams.

5.8 Testing

The complete testing process is outlined in the "FL-ATIS System Test Plan" and the Performance Monitoring Q/A Plan. The fundamental philosophy driving the development and execution of this test plan is a multi-tiered iterative approach to testing, beginning with individual unit tests as the lowest-level components of the system become available. These unit tests are followed by various integration and sub-component tests, until there is a final component integration and factory acceptance test (FAT). Once each system component has passed its FAT, the final system integration test will be performed, followed by the final system FAT. At this point the system is signed-off and turned over to FDOT for User Acceptance Testing (UAT) prior to system GoLive upon successfully completing the UATs.

5.9 Timeline

The specifics of the FL-ATIS project timeline are given in the FL-ATIS Project Plan, Version 6.0, FL-ATIS Proj Plan - CDRL No. 0205.6.mpp, and its associated PERT chart, 20071107 FL-ATIS PERT - CDRL No 0205.6.pce. The original GoLive date for the project was 31July08. As of version 6.0 of the project plan this date has slipped to 9Sep08, although all parties are still striving to meet the original 31Jul08 GoLive date as of this time. Subsequent to the GoLive date transition of the existing regional Florida 511 systems to the new statewide FL-ATIS 511 system will begin, as defined in the FL-ATIS System Transition Plan, CDRL No. 0210.n.

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6 IDS SUBSYSTEM-C2C PLUGIN

The FL-ATIS Center-to-Center Plug-in is implemented as a single application responsible for receiving data and republishing generated floodgate data.

Much of the C2C Plug-in's source code was furnished by FDOT.

6.1 C2C Plug-in Design

- Persistence of published SunGuide DMS, CCTV, Event, and Location data to the C2C Infrastructure.
- Management of incoming floodgate commands and publishing of changes to the floodgate data.

The FL-ATIS Center-to-Center Plug-in is implemented as a single application responsible for receiving data and republishing generated floodgate data:

This Plug-in persists device and event status data received from the C2C Infrastructure and accept floodgate control requests from remote centers. The following diagram depicts the C2C ATIS Plug-in design. C2C ATIS Plug-in components are discussed in the C2C Plug-in Theory of Operation Description.

Note: The way in which individual SunGuide processes interact with other processes can be clarified by examining the appropriate theory of operation diagram; other interfaces, processes, etc. described within the design pages may be assumed to be internal to the design in review. Also, XML interfaces that are not described in this document are defined in pertinent Interface Control Documents (ICDs).

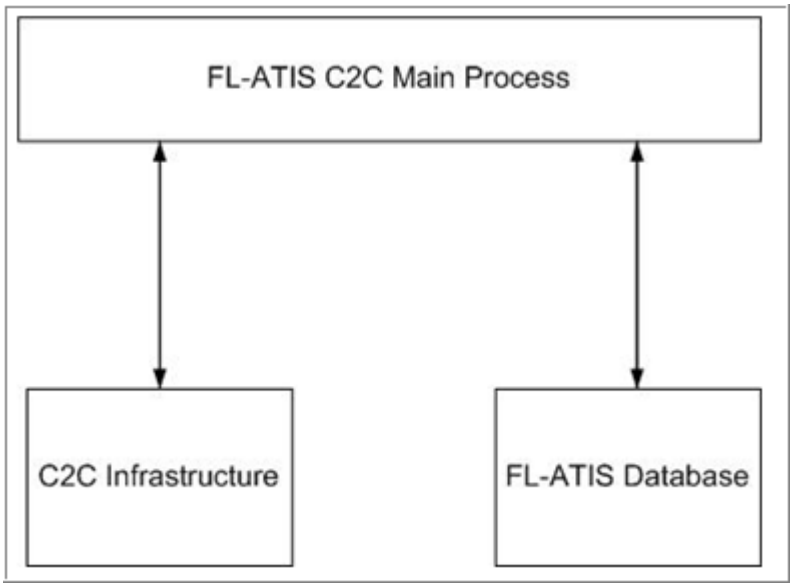

Figure 40: C2C Main Process

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6.1.1 Process Design

The following diagram depicts the classes used by the FL-ATIS C2C Plug-in as well as the instantiation of other classes.

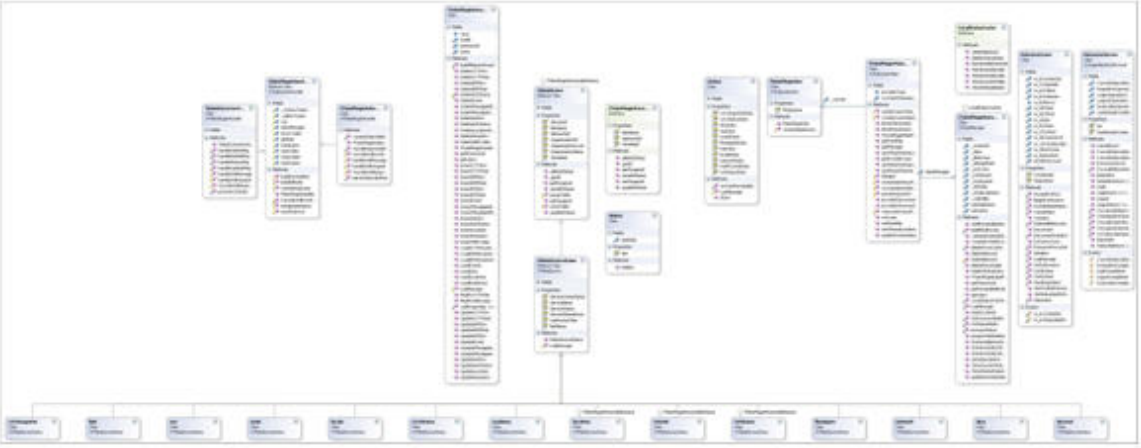

Figure 41: Process Design

Refer to File 1: Process Design for enlarged view.

Process Design

File 1: Process Design

When the FL-ATIS C2C Plug-in starts up, it sends subscribe requests to the C2C Infrastructure for all configured data types (CCTV, DMS, Location, TVT Status, Event). Internal data stores are initialized as status data is received. Once a received entry has been validated, any changes to the cached data are persisted to the FL-ATIS database.

When C2C data and event updates are received by the Plug-in, the local store of data is updated. After caching the updates, they are persisted to the FL-ATIS database using the configured database connection.

When a floodgate control request is received by the Plug-in from the Command Receiver element of the C2C Infrastructure, the request is converted to valid Floodgate data and persisted to the database. A response is generated based on success in persisting the new floodgate data and is returned to the Command Receiver for forwarding to the original remote requester. The new floodgate data is then pushed out the C2C infrastructure.

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6.2 C2C Plug-in Theory of Operation

The FL-ATIS Center-to-Center (C2C) Plug-in Subsystem provides for the persistence of status and control information received from remote traffic management centers (TMCs). The figure below depicts how the C2C FLATIS Subsystem interacts with other components in the system.

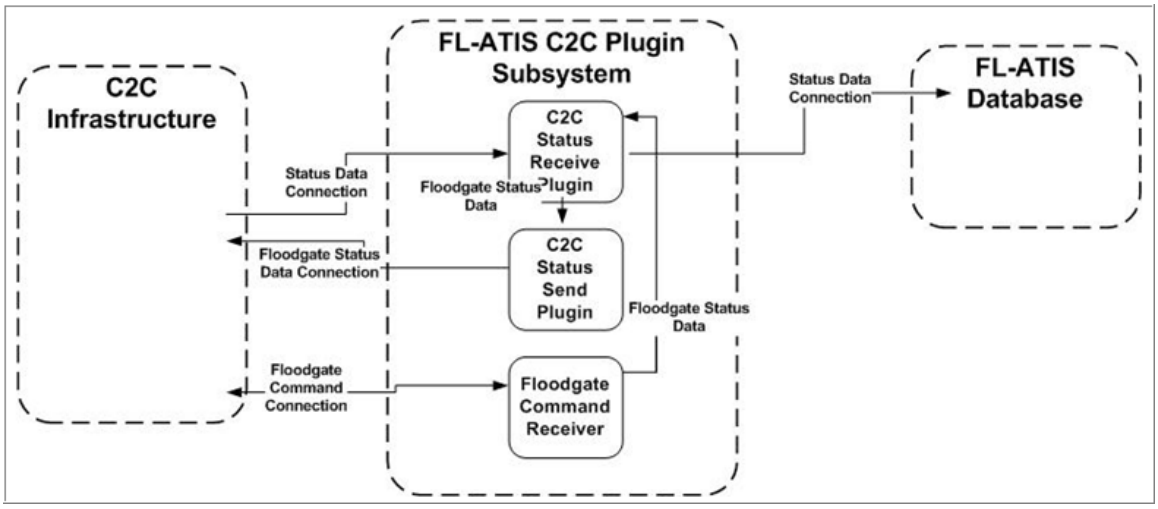

Figure 42: C2C Subsystem

6.2.1 Overview

The FL-ATIS C2C Plug-in subsystem provides the following capabilities:

- Persistence of device and network configuration and status information
- Receiving Floodgate commands from multiple TMCs
- Distributing Floodgate status to the C2C infrastructure

6.2.2 Subsystem Components

This section provides a high-level design description of the FL-ATIS C2C Plug-in. The FL-ATIS C2C Plug-in consists of three major components: the C2C Status Receive Component, the C2C Status Send Component, and the Floodgate Command Receiver Component.

The FL-ATIS Plug-In consists of a single executable, which handles receipt of status data from the C2C infrastructure, persist device and event data, and manages receipt of Floodgate Commands and redistribution of Floodgate Status messages.

6.2.2.1 C2C Status Receive Component

The C2C Status Receive Component handles incoming status data provided by the C2C infrastructure preparing it for persistence and storing the prepared data.

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6.2.2.1.1 Infrastructure Status Data Connection

The C2C Status Receive Component manages the detailed communication with the C2C Provider using a proxy. Subscribed data types are retrieved from the C2C Provider. Current status data and update status data is sent to the C2C Provider.

6.2.2.1.2 FL-ATIS Database Status Data Connection

The FL-ATIS Database Status Data Connection manages the communication with the ATIS Database.

6.2.2.2 C2C Status Send Component

The C2C Status Send Component handles distribution of Floodgate Status data managed by the subsystem.

6.2.2.2.1 Infrastructure Floodgate Status Data Connection

The C2C Status Send Component manages the outgoing connection to the C2C Infrastructure via a web proxy. As new Floodgate Message updates are created by the Floodgate Command Receiver component, those updates are pushed out into the C2C Infrastructure through this connection.

6.2.2.3 Floodgate Command Receiver Component

The Floodgate Command Receiver Component manages command connections through the C2C Infrastructure and processes Floodgate Commands, persisting the created Floodgate Message Status and passing it to the C2C Status Send Component for redistribution to the infrastructure.

6.2.2.3.1 Infrastructure Floodgate Command Connection

The Infrastructure Floodgate Command Connection manages the detailed command communication with the C2C Infrastructure using a proxy. Incoming commands provided by the Floodgate Command Connection are processed by the Floodgate Command Receiver Component, and valid floodgate commands are acknowledged and processed.

6.2.3 Error Handling

The FL-ATIS C2C Plug-in components use the SunGuide Status Logger service for logging errors. The C2C ATIS Plug-in executable has configurable logging levels to allow for adjusting the system process data that is recorded.

7 Video Aggregation Subsystem (VAS)

7.1 Constraints

The system is limited by Internet Uplink capacity (10MB).

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7.2 Subsystem Overview

The Video Aggregation Subsystem (VAS) shall disseminate to third party agencies and the public all available JPEG images and video feeds available through regional 511 websites at the time of the ITN advertisement.

Public access to the VAS will be via the Website Component of the Information Dissemination System (IDS). The public will be able to select what camera images or video feeds to view by clicking on a CCTV icon on the IDS Web site

Users will be provided with both map and menu-based camera selection to view streaming video and video snapshots. The VAS will be designed with comprehensive administrative features to facilitate the management and control of the system. The system will provide multiple levels of user access, management of hardware and software settings, and reporting tools.

7.3 Subsystem Architecture

The proposed VAS design will be discussed in terms of hardware and software architecture for both video streaming and image distribution respectively. The VAS will utilize the FLATIS network communications infrastructure to access and disseminate the FDOT District and Florida Turnpike TMC located digital video and image sources.

VAS – Video Streaming

Figure 43 illustrates the hardware architecture for video streaming. The design will employ MPEG 2 to MPEG 4 transcoders at District 5 and District 7 to 'transcode' (convert) local MPEG 2 streams for transmission to the centrally located Real Networks Helix (RNH) Server. The transcoders will be installed, configured and tested to ensure seamless integration with the RNH Server. The design assumes that 12 video streams will be provided in MPEG 2 format (based on ITN requirements) and that a late model VBrick MPEG 2 decoder is capable of decoding those MPEG 2 streams. District 5 will be provided 8 MPEG 2 to MPEG 4 transcoders, and District 7 will be provided 4. The design also assumes the following (based on ITN requirements):

- The remaining 4 to 8 streams will be provided in MPEG 4 format, and require no encoding, transcoding or format conversion.
- Only Districts 4, 5 and 7 will be providing video streams.
- Use of existing District TMC switches, racks and firewalls (switches, racks and firewalls to be furnished by FDOT).

Digital video from new and existing encoders will be streamed over the internet to the RNH server. The RNH server shall establish an IP connection to each configured encoder, thereby soliciting the relevant MPEG 4 video stream. Note that District 4, 5 and 7 firewalls must be configured (by FDOT) to allow the RNH server to access all relevant encoders, and to allow for MPEG 4 video stream transmission to the RNH Server. The IDS web server(s) will direct user requests for streaming video to the RNH Server, which shall provide the selected stream to the end user. The RNH Server will be co-located with the other FLATIS servers.

The RNH Server will aggregate, buffer, manage and very efficiently redistribute streaming video to the public. The RNH Server is also capable of delivering RealAudio, Real Video, Windows Media, QuickTime, MP3, and 3GPP* (H.263 and H.264), providing the flexibility to adopt new formats in the future. The RNH Server is a proven, high-performance and industry leading cross-platform video streaming server.

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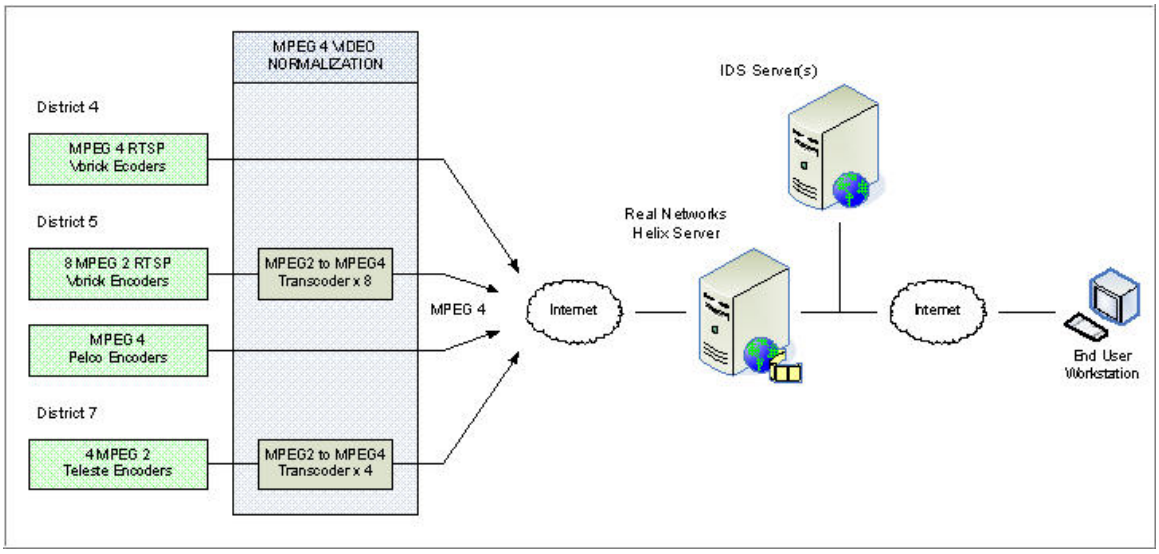

Figure 43: VAS Video Streaming Hardware Design

Figure 45 illustrates the software architecture for video streaming. The new and existing encoders will stream MPEG 4 encoded video to the RNH Server. The RNH server will be responsible for buffering all available video streams and for retransmitting those streams to end users with minimal latency. Each live broadcast will be unicast to individual media players, as shown in the illustration below:

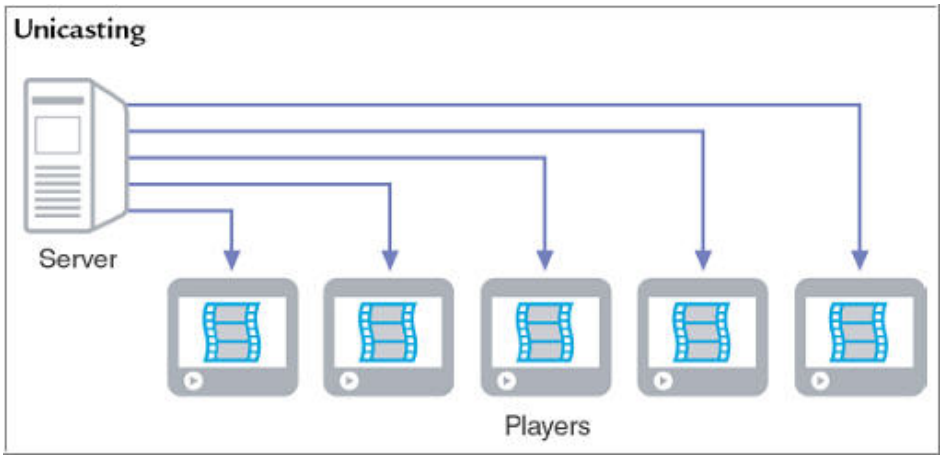

Figure 44: Unicasting

In unicasting (see Figure 44, above), each broadcast stream uses bandwidth; the system will therefore be limited by available outgoing bandwidth.

Public access to these streams will be through an IDS web page hyperlink; selecting a link associated with a particular camera will launch a media player and stream live video from the RNH server. The RNH Server will accept requests for video streams over the Real Time Streaming Protocol (RTSP) control protocol, and will deliver the stream to any client that supports the Real-time Transport Protocol (RTP) packet format; i.e. RealPlayer, QuickTime Player, etc (we will select which player is utilized by the IDS Website).

The VAS administrator will manage and maintain the RNH server through the Helix Administrator. The Helix Administrator is a secure, HTML-based, graphical user interface

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that will be used to modify and manage the RNH Server from a browser anywhere on the network. Helix Administrator will be used to configure RNH Server features, as well as monitor activity.

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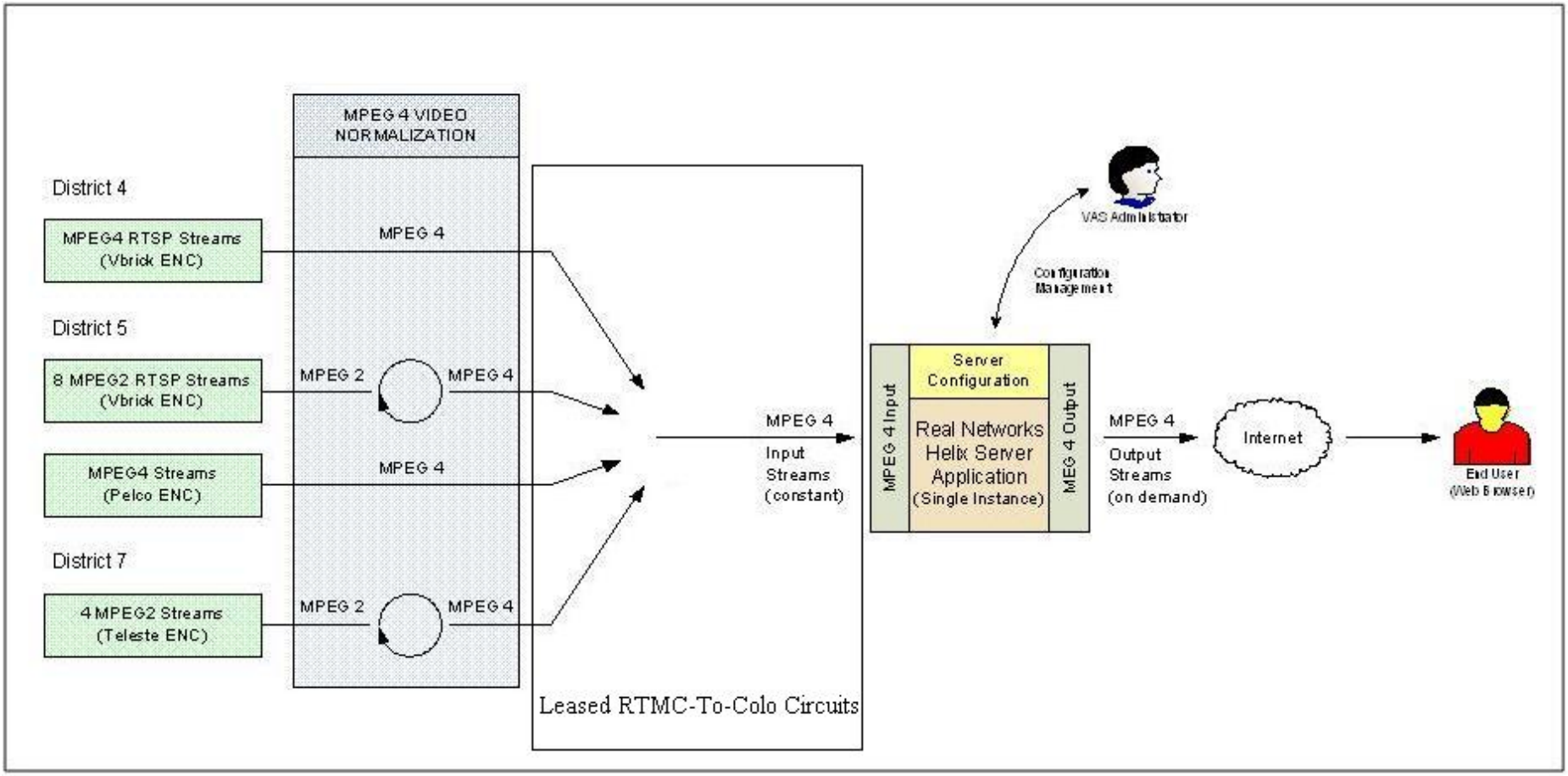

Figure 45: Software Architecture - Video Streaming

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VAS – Image Distribution

Figure 46 illustrates the hardware architecture for Image Distribution. The design will employ existing (FDOT provided) image servers at District 1, District 4, District 5, District 6, District 7 and FTE – which shall store the most recent relevant CCTV images.

The design also assumes the following (based on ITN requirements):

- Only Districts 1, 4, 5, 6 and 7 will be providing images
- The images will be provided by FDOT (the VAS is not responsible for capturing or creating images)
- IBI will be able to make use of existing District TMC switches, racks and firewalls (switches, racks and firewalls to be furnished by FDOT)

Images stored on District image servers shall be collected, at a configurable interval, by the Image Management Server – which shall make them available to the IDS Website for dissemination. The method of collection may vary by District (the image data transfer mechanism). The Image Management Server will be equipped with adequate storage space and processing power to store and manage the dissemination of all captured images.

The central Image Management Server shall establish an IP connection to each configured District image server, in order to initiate (periodic) image transfer. Note that District 1, 4, 5, 6 and 7 firewalls must be configured (by FDOT) to allow the central Image Management Server to access all District image servers. The Image Management Server will be co-located with the other FLATIS servers.

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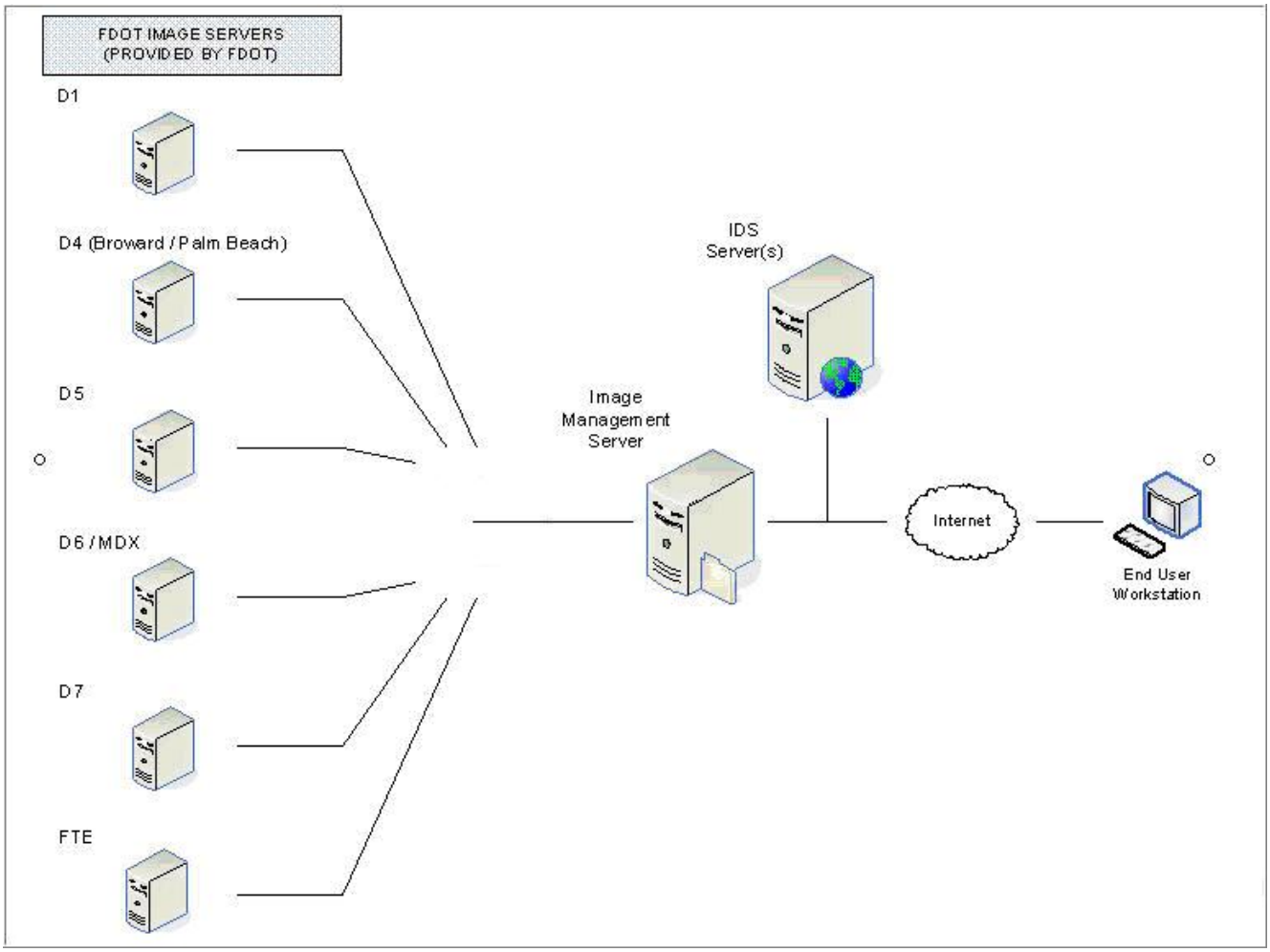

Figure 46: Hardware Architecture - Image Distribution

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Figure 47 illustrates the software architecture for Image Distribution. The Image Management Server shall employ custom software to collect and store District CCTV images. This custom software will poll District 1, 4, 5, 6 and 7 image file folders for the most recent CCTV images at a configurable interval. Those images shall be retrieved (copied to the Image Management Server) via FTP or Windows File Sharing.

The Image Management Server will employ a database to manage and maintain the mapping of images to SunGuide TMC CCTV identifiers, and possibly the image file naming conventions employed by SunGuide TMC image servers.

Image Management Server repository images are made available to the IDS for dissemination via the IDS Website.

Public access to specific images will be blocked based on CCTV blockage information provided by the Data Fusion Subsystem. Relevant IDS web page CCTV image hyperlinks will be disabled, blocking access to those images while graphically indicating that they are unavailable.

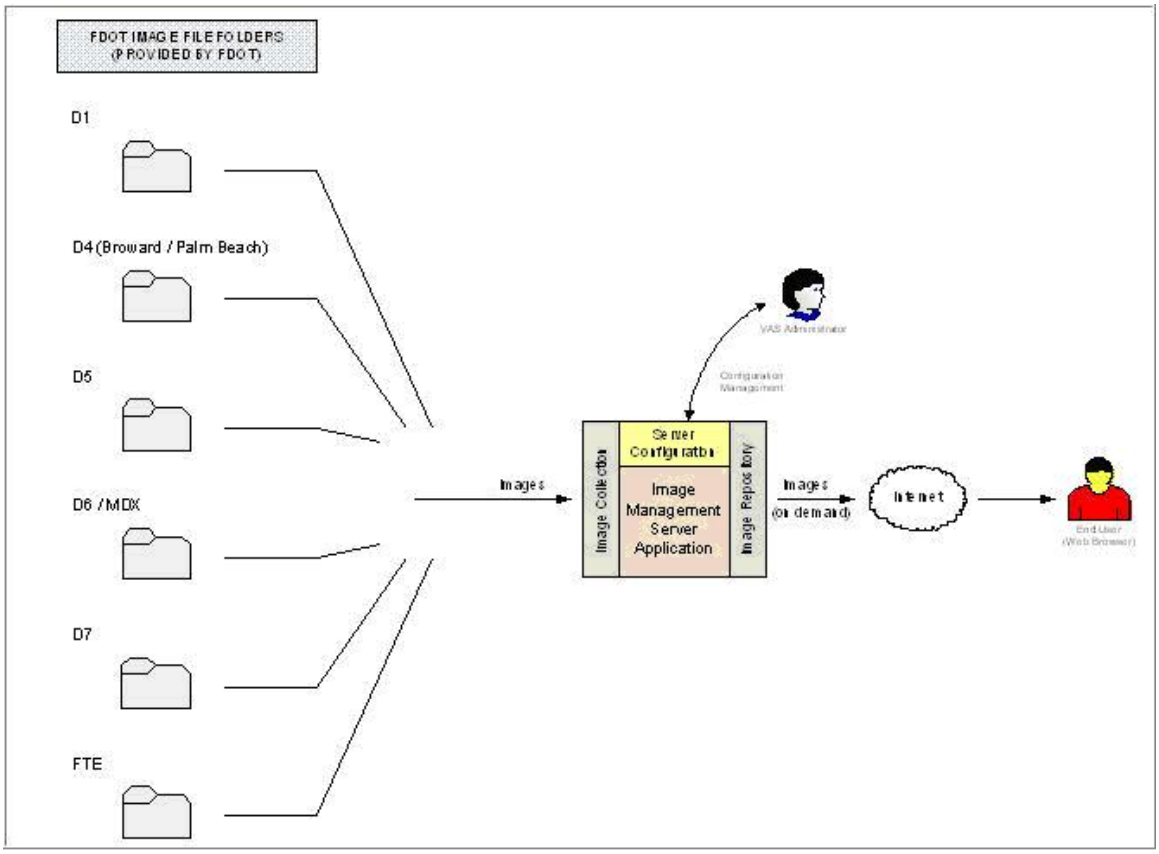

Figure 47: VAS Image Distribution Software Design

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7.4 Subsystem Data Design

7.4.1 Video Streaming

There are two data elements required by the video distribution process:

- XML list of cameras to block (input from Data Fusion Subsystem);
- CCTV ID to Helix Server URL Mapping.

7.4.2 Image Distribution

There are three primary data elements required by the image distribution process:

- XML list of cameras to block (input from Data Fusion Subsystem);
- CCTV ID to Image Mapping;
- Image Collection Configuration (i.e. image collection polling interval).

Note: Camera names need only be unique to each SunGuide installation (TMC) – not to each District.

7.5 Subsystem Human Interface Design

There are no custom user interface elements associated with the video streaming component of the VAS.

The Image management component of the VAS has an xml configuration file, which does not require a user interface.

7.6 Interfaces

7.6.1 Internal Interfaces

There are no custom internal interfaces associated with the VAS.

7.6.2 External Interfaces

- Input from Districts: jpeg image files, video streams (note that camera names need only be unique to each SunGuide installation (TMC) – not to each District).
- Input from Data Fusion: XML list of cameras to block, as described above (note that camera names need only be unique to each SunGuide installation (TMC) – not to each District).
- Output to IDS / Public: jpeg image files, video streams.

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8 Quality Management Subsystem (QMS)

The QMS will monitor the health and performance of the 511 system using a Commercial off the shelf solution SiteScope from HP/Mercury.

SiteScope is an agent-less monitoring tool that can monitor 65 different health and performance metrics. It can monitor servers running Windows Server 2000 or higher, and most versions of Linux.

8.1 Constraints

The QMS will only monitor servers that are accessible through the FDOT network and support one or more of the access methods provided by the COTS application (e.g. NetBIOS for Windows servers, SSH for UNIX servers) Servers that do not reside in the same physical location as the QMS server must be accessible over the network (i.e. through a VPN). Licensing of Sitescope is based on points and for each access point monitored there is a fee. The required number of points will be purchased to monitor system health as defined in the requirements and in section 8.3 below. Although sitescope is capable of monitoring additional points, the system will not be able to monitor additional items outside of this scope unless additional license points are purchased. The user interface and the reports that may be accessed through it will be limited to what is provided by SiteScope. SiteScope will only monitor the health and performance of the system – it will not verify data integrity. A separate tool will be developed to report on the time latency of data as it arrives in the various subsystems.

8.2 Subsystem Overview

The 511 Administrative Portal will provide secure Internet access to FLATIS on-line management services including IVR & website analytics reporting, Quality Management System reporting.

The health and performance monitoring aspect of the Quality Management Subsystem (QMS) will be handled by an agent-less COTS application. The COTS application will be used to monitor status and performance metrics of the system including:

- Network health – Can be configured to ping a set of servers, routers, and other network devices and log an error if a device is unreachable.
- Disk status – Can be configured to monitor a file, directory, or disk to track size, free space, or whether or not certain files and/or directories exist.
- Application status – Can monitor applications by: checking the status of a service or process, or periodically reading from an XML file written by the monitored process.
- Server Usage – Monitors a servers CPU and memory usage and can be configured to log when a threshold is exceeded.

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When problems occur or thresholds are exceeded, the QMS logs pertinent information that is used to analyze why the problem occurred. In addition to logging when problems occur, the QMS will be configured to send email, SMS, and/or pager alerts when a problem occurs. The COTS application provides a web-based user interface where administrators can see real-time system performance information. The same user interface is used to create reports from logged data.

The QMS will also track data as it moves through the system. Traffic data and incident reports will be time stamped as it moves through the system (e.g. when it is received by the system, when it is available in the IVR, when it is available on the website). There will be a reporting tool, in addition to the COTS software, that will be used to report on the latency of the system.

8.3 Subsystem Architecture

The QMS is handled by a SiteScope and will be run on its own server. The QMS monitors all servers and network devices in the system for various health and performance metrics. The QMS communicates with other servers and devices through the FDOT network. Servers that do not reside in the same physical location as the QMS must be accessible through the network (i.e. via a VPN). The specific subsystems to be monitored by the QMS are:

- Data fusion subsystem (Data Fusion and Center-to-Center communications link)
- Information dissemination subsystem (IVR and website)
- Video aggregation subsystem

The QMS will communicate with the subsystems as shown in Figure 48: QMS Architecture.

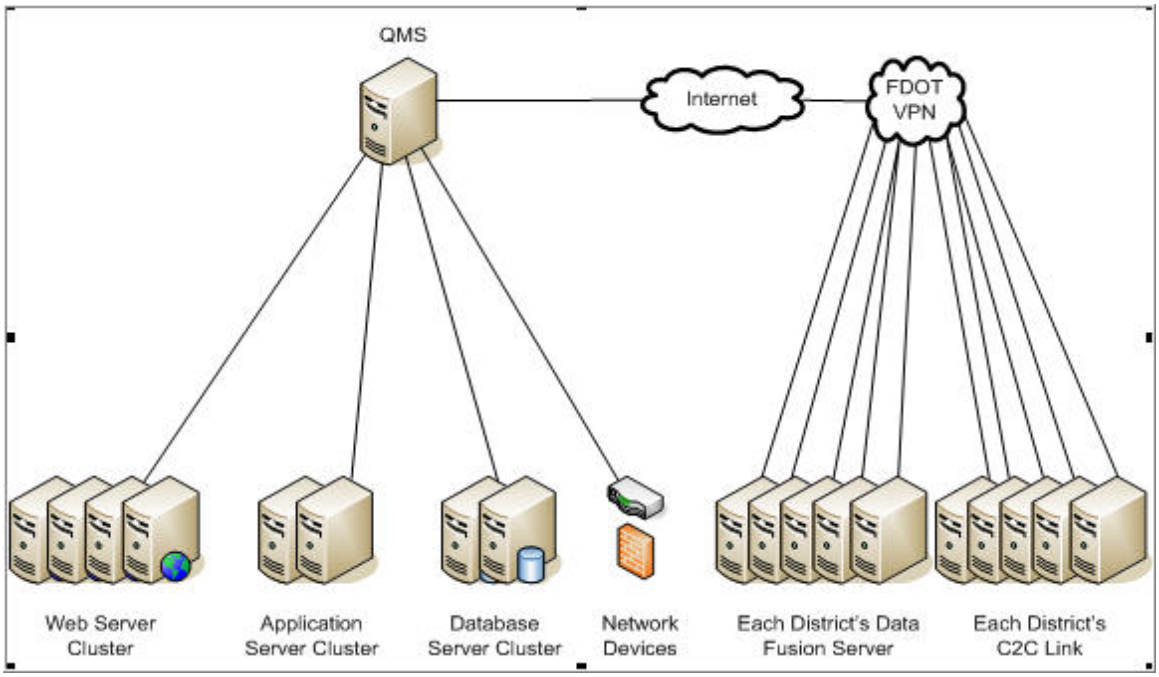

Figure 48: QMS Architecture

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8.4 Design Rational

SiteScope was chosen as the COTS application to be used for the QMS as it is an industry-recognized agent-less monitoring tool that meets all the requirements for monitoring the health and performance of the FDOT system, and can be deployed more easily and cost-effectively than other monitoring solutions.

8.5 QMS Data Design

There will be one table associated with the Data design for QM001 and QM006. This will include timestamps for latency. This information is also stored within the Data Tables

8.6 QMS Human Interface Design

Users will interact with the QMS through the IDS web-site administrative portal. Within the administrative portal will be access to the SiteScope web based user interface provided by the COTS software. This interface is used to configure the application, specifically, which servers and which metrics to monitor. The same interface allows users to view current system health, configure email alerts, and performance information and generate historical reports. Administrators will be able to configure alerts based on defined performance thresholds. If the level of performance exceeds the threshold the configured email subscriber will be notified.

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8.6.1 Opening Page

The opening page of the Administrative Portal will feature a list of services of services that the user will be able to access, including:

- System Health Reporting
- Data Tracking Reporting

This list of services will be presented as a list of navigable links. Clicking on any one of these links will send the user to the corresponding service.

The QMS will identify the current data and time

Clicking on the 'System Health Reporting' link will send the user to the SiteScope management tool.

Clicking on the 'Data Tracking Reporting' link will send the user to the data tracking reporting page to be developed by IBI Group.

The QMS will only be available in English.

The QMS will provide a link to the 511 website.

The QMS will provide on-line help and a user feedback link that will allow the user to send an email to the LogicTree-IBI Group team.

Admin Portal site provides a QMS tab, which provides a window to the SiteScope management site. Three monitoring groups will be setup: Application Servers, Database Servers and Web Servers.

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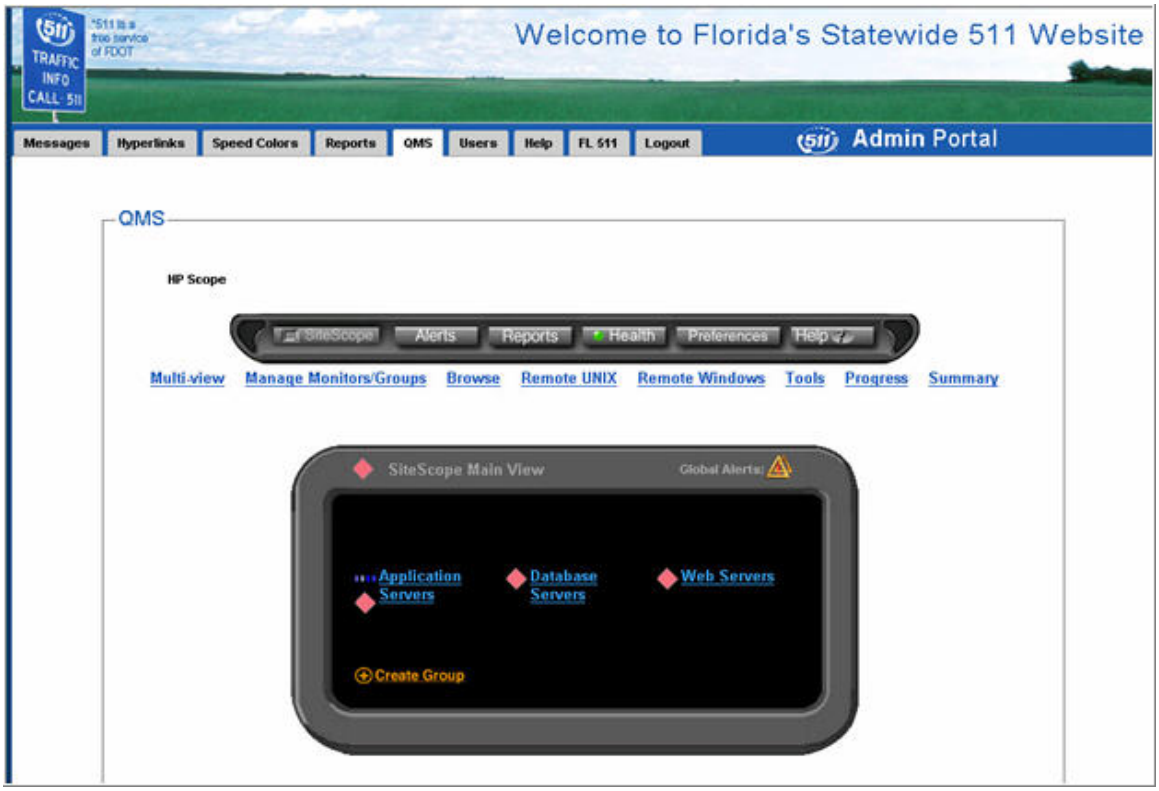

Figure 49: SiteScope Front Page

Within each group, there will be a list of monitors, such as Network availability (Ping), Server disk usage and Server CPU Usage. On this page, the user may view status of each of the monitors.

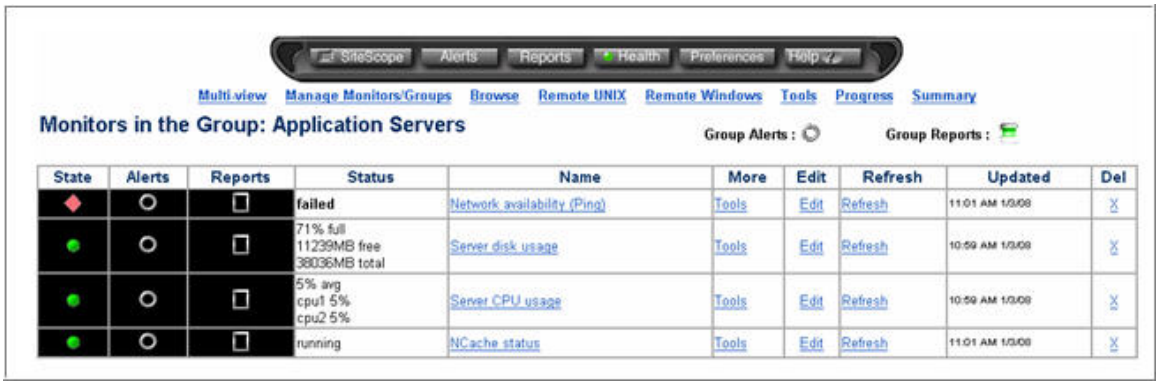

Figure 50: Server Monitors

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Clicking on the “Alerts” button on the top, users may setup alerts for each group and monitoring points.

Clicking on the “Reports” on the top, users may generate reports for each group. User may schedule report generation and setup SiteScope to sent the report by email.

Management Report for Application Servers Group

(information from 8:40 AM 3/31/08 to 8:40 AM 4/1/08)

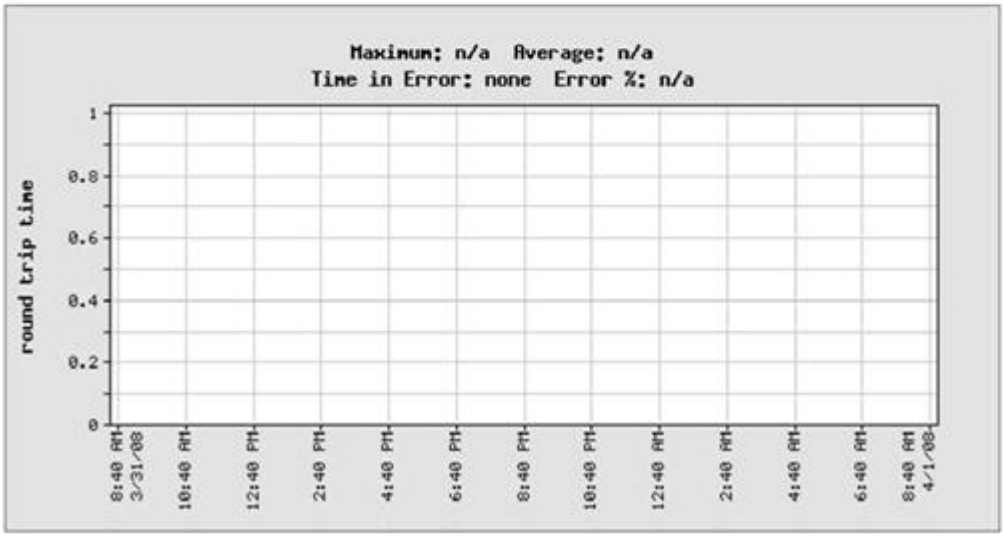
Uptime Summary

Name	Uptime %	Error %	Warning %	Last
Network availability (Ping)	0	0	0	no data
Server disk usage	0	0	0	no data
Server CPU usage	0	0	0	no data
NCache status	0	0	0	no data

Measurement Summary

Name	Measurement	Max	Avg	Last
Network availability (Ping)	round trip time	n/a	n/a	n/a
Server disk usage	percent full	n/a	n/a	n/a
Server CPU usage	utilization	n/a	n/a	n/a
NCache status	status	n/a		n/a

Network availability (Ping)



Server disk usage

Figure 51: Report for Application Servers Group Page 1

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8.7 Interfaces

8.7.1 Internal Interfaces

The QMS User Interface will be integrated with the Admin Portal.

8.7.2 External Interfaces

The QMS will interface with subsystems, servers, and network devices in the 511 system. The QMS will use various protocols to interface with the 511 system, such as NetBIOS for Windows servers, or SSH for Linux servers to gain access to the server. The QMS will monitor various performance metrics, such as:

Web Servers

- Network availability – Periodically ping server
- Web Server availability – Monitor status of web server/service is running, monitor network status of the server
- Server usage – Monitor the CPU and disk usage of the web servers
- URL Monitor – Monitor a URL for availability, content, and/or link integrity

Application Servers

- Network availability – Periodically ping server
- Server usage – Monitor CPU and disk usage of the application servers
- Application status – Application server status, custom application status (monitored by checking service or process status, and/or XML metrics)

Database Servers

- Server availability
- Server usage
- Database status

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The subsystems will be monitored as follows:

Table 7: Monitoring of Subsystem

Subsystem	Operating System	Monitoring Technique
Data Fusion Subsystem (SunGuide C2C Provider Process and Server)	Windows Server 2003	Monitored as an application server
Information Dissemination Subsystem	Windows Server 2003	Web Component: monitored as a web server IVR: Monitored as an application server
Video Aggregation Subsystem	Windows Server 2003	Monitored as an application server
Database Subsystem	Windows Server 2003	Monitored as a database server

8.8 Testing

QMS testing will involve creating failure scenarios for each metric that is monitored.

- Network availability – Physically disconnect a server from the network, verify that the QMS detects the error
- Web server availability – Stop the web server on one of the machines (with all network connections still in place), verify that the QMS detects the error.
- URL Monitor – Substitute the main page of the website with a blank page, verify that the QMS detects the incorrect page.
- Server usage – Monitor CPU usage to determine if maximum threshold has been exceeded.
- Application – Stop an application that is being monitored by the QMS, verify that the QMS detects the error.
- Database status – Stop the database service, verify the QMS detects that the database is down.

Note also that the QMS will detect that a primary server has failed and that the relevant secondary server is operational.

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9 Design Requirements Traceability Matrix

	Subsystem Component
	ITN Requirement
	Design Requirements

Table 8: Design Traceability Matrix

ITN Requirements ID	SW Module ID (Design Req.)	SDD Reference	Topic	Design Requirement
Web Component				
ID001W				The Website Component shall provide context sensitive help to users who request it.
ID001W	WEB49	4.5.2 Every Page	Hyperlinks	When the Help hyperlink is selected from any page - the Help Page is displayed and the cursor is pointing to the beginning of the Help section for the page from which the user initiated the request for Help.
ID002W				The Website Component shall handle a minimum of 25 million page views during the first year of service.
ID002W	WEB03	4.3.1 Design Rationale		The website shall consist of a 3 tier architecture
ID002W	WEB04	4.3.1 Design Rationale		The website architecture shall use 4 load balanced web servers.
ID002W	WEB05	4.3.1 Design Rationale		The website hosting service shall have a minimum bandwidth of 100 MBps
ID003W				The Website Component shall handle a minimum of 50 million page views by the fifth

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ID003W1				year of operation.
ID003W ID003W1	WEB06	4.3.1 Design Rationale		The website architecture shall be scaleable to allow for additional hardware to support 50 million page views by the fifth year of operation.
ID003W ID003W1	WEB07	4.3.1 Design Rationale		The website ISP shall be capable of expanding bandwidth to support 50 million page views by the 5th year of operation.
ID004W				The Web help page shall provide information in text and/or graphic form on the basic use of the Internet Web site and statewide 511 system, including listings of available information the site.
ID004W	WEB380	4.5.12 Help Page	Purpose	The Help Page provides text information that describes Traffic terms and site usage
ID004W	WEB381	4.5.12 Help Page	Opening View	When the Help Page is opened from the Home Page - a list of all possible Help subjects is displayed sorted by information category.
ID004W	WEB382	4.5.12 Help Page	Opening View	When the Help Page is opened from any page in the site, the Help Page opens pointing to the information relating to the page where the user came from.
ID004W	WEB383	4.5.12 Help Page	Information	The Help Page provides text information that describes how to use the statewide 511 system.
ID004W1				The Web help page shall include an email link to contact the system's webmaster.
ID004W ID004W1	WEB105	4.5.3 Home Page & 4.5.12 Help Page	System Admin. Contact	The Web help page and home page shall have an email link to contact the system administrator.
ID004W ID004W1	WEB106	4.5.3 Home Page & 4.5.12 Help Page	System Admin. Contact	When the user selects the email hyperlink, their default email program will open up with the address and subject automatically populated.
ID004W ID004W1	WEB107	4.5.2 Every Page & 4.5.12 Help Page	System Admin. Contact	The email hyperlink as well as text email address will be provided in the contact us and help pages of the website.

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ID005W				Links to other web sites shall be included that provide additional information to supplement the multimodal information already provided.
ID005W	WEB48	4.5.2 Every Page	Hyperlink - Link	When the Links hyperlink is selected from any page - the Link Page is displayed.
ID005W1				Web sites hosted by other agencies to which links shall be provided shall include at a minimum: • Transit agencies • Airport services • Seaports • Tourism agencies • Evacuation management agencies • Other partners • Border state (e.g., Georgia) ATIS services • Consumer Information Network Regional Transportation Organization (CIN) • Parking • Major event venues
ID005W ID005W1	WEB390	4.5.11 Links Page	Links Information	A dedicated links page accessible by the top navigation menu will provide the related web site hyperlinks. These hyperlinks are also to be maintained by the Content Management Portal.
ID005W ID005W1	WEB391	4.5.11 Links Page	Links Provided	The Link page provides a list of links to other agencies including transit agencies, airport services, seaports, tourism agencies evacuation management agencies, other partners, border state ATIS services CIN, Parking Major event venues.
ID006W				The Website Component shall provide a scrolling banner across the web site containing floodgate messages according to whether the user is viewing at the region, county, city, roadway and roadway segment.
ID006W	WEB54	4.5.2 Every Page	Floodgate	Every Page has a scrolling banner for floodgate messages.

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ID006W	WEB55	4.5.2 Every Page	Floodgate	Floodgate messages relate to the geographic level being viewed - regional, county, city, roadway or roadway segment.
ID006W1				The Web site shall have the capability of displaying an override message on the home page for use in displaying severe weather, evacuation, homeland security, and child abduction alerts.
ID006W1	WEB102	4.5.3 Home Page	Override Message	On the Home Page, an override message can be shown that is not sensitive to roadway level (regional, city, etc). This message is visible when the page opens.
ID006W1	WEB103	4.5.3 Home Page	Override Message	The override message is in bold red letters.
ID006W1	WEB104	4.5.3 Home Page	Override Message	On the override message banner there is a close (x) option in the upper right hand corner.
ID007W				The Website shall comply with all ADA Section 508 requirements.
ID007W	WEB13	4.3.2.3.3 511 Main Website	*Text*	All geographic information will be duplicated in text-based tables easily accessible as tabs on top of the page.
ID007W	WEB14	4.3.2.3.3 511 Main Website		Web page and Video Aggregation System displaying video streams from the districts will synchronize if available time and date captions embedded in the video.
ID007W	WEB15	4.3.2.3.3 511 Main Website	*No Color*	Web page will simultaneously be tested in color and on black and white monitors during design and implementation to ensure all elements in color is also available without color. For example, hyperlinks on web page that rely heavily on color to distinguish themselves will in addition have underlines.
ID007W	WEB16	4.3.2.3.3 511 Main Website		HTML will be coded in such a way so that it will indicate the structure in a non-visual way as well by using structural markup in the absence of any associated style sheets.
ID007W	WEB17	4.3.2.3.3 511 Main Website		Web pages must use redundant text links for every image link so that screen readers can provide choices to people who cannot see the choices presented on the image.

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ID007W	WEB18	4.3.2.3.3 511 Main Website		Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
ID007W	WEB19	4.3.2.3.3 511 Main Website		The first data row of the table in web content source is composed of <th> table header elements instead of <td> table data elements.
ID007W	WEB20	4.3.2.3.3 511 Main Website		Mark-up shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.
ID007W	WEB21	4.3.2.3.3 511 Main Website		Web page will not use frames. All elements will be displayed in one logical web page.
ID007W	WEB22	4.3.2.3.3 511 Main Website		Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.
ID007W	WEB23	4.3.2.3.3 511 Main Website		A text-only page, with equivalent information or functionality, shall be provided to make a website comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.
ID007W	WEB24	4.3.2.3.3 511 Main Website		When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.
ID007W	WEB25	4.3.2.3.3 511 Main Website		The web page will not require additional applets or plug-ins other than the standard internet browsers with JavaScript enabled.
ID007W	WEB26	4.3.2.3.3 511 Main Website		When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and

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				functionality required for completion and submission of the form, including all directions and cues.
ID007W	WEB27	4.3.2.3.3 511 Main Website		A method shall be provided that permits users to skip repetitive navigation links.
ID007W	WEB28	4.3.2.3.3 511 Main Website		When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.
ID007W1				All information shall be delivered in both a graphic and text-based format using one or more multicolored maps and tables of roadways and other facilities for which information is provided
ID007W1	WEB31	4.3.2.3.3 511 Main Website	ADA	All information in the website will be available in text and graphical format.
ID007W1	WEB150	4.5.4 Map Page	Purpose	The Map Page shall present traffic information (i.e. traffic congestion and speeds, travel times, road conditions and closures, incidents, weather, CCTV and road signs) in both GIS web-based mapping and text-based tables user interfaces.
ID007W2				The Web site component shall support website users who are color blind.
ID007W2	WEB30	4.3.2.3.3 511 Main Website	ADA	Web page shall be able to convey information in gray-scale to cater to different color-blind users.
ID007W2	WEB169	4.5.4 Map Page	Map Legend – Traffic Speeds	When the speed legend is displayed, there is link called "Color Options" which when opened allows the user to choose between 3 different set of color options for the highway speeds. One option is the default option, one option is a range of gray colors, and the third option has blue instead of green with the other colors the same.
ID008W				The map and all content contained on the Web site shall be automatically updated and refreshed whenever new information is available.

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ID008W	WEB09	4.5.2 Every Page	New Information	Web page shall poll the latest data from the database at a specific interval.
ID008W1				All data provided to users via the Website shall be time stamped to indicate its freshness.
ID008W1	WEB10	4.5.2 Every Page	Time stamped	All data from the database to the website is time stamped.
ID008W2				The web site shall indicate the last date/time the web site was updated with new information.
ID008W2	WEB11	4.5.2 Every Page	Time stamp	There is a time stamp on all pages indicating the last time the information was updated
ID009W				All congestion-related roadway information shall be color-coded for better understanding by users.
ID009W	WEB166	4.5.4 Map Page	Map Legend – Traffic Speeds	When the "Traffic Speeds" legend item is checked, the highways on the map for which there is travel speed information supplied will be color-coded to represent highway speed.
ID009W	WEB167	4.5.4 Map Page	Map Legend - Traffic Speeds	When the "Traffic Speeds" legend item is checked, a drop down menu appears showing the color legend for the highway speeds. There are 3 categories of speeds: “Slow”, “Moderate”, Fast”, and "No Data". The "No Data" response is for highways where there could be data from the system but no data has been received.
ID009W	WEB168	4.5.4 Map Page	Map Legend - Traffic Speeds	Speed links shall be color-coded to represent the following scenarios: Slow (Red) Moderate (Yellow) Fast (Green) No Data (Gray)
ID009W1				Multiple color-coding options shall be provided to meet the needs of color-blind users.
ID009W1	WEB 30	4.5.2 Every Page	ADA	Web page shall be able to convey information in gray-scale to cater to different color-blind users.
ID009W1	WEB169	4.5.4 Map Page	Map Legend –	When the speed legend is displayed, there is a link called "Color Options" which when opened allows the user to choose between 3 different sets of color options for the

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			Traffic Speeds	highway speeds. One option is the default option, one option is a range of gray colors, and the third option has blue instead of green with the other colors the same.
ID0010W				Selectable (on/off) map layers shall be utilized to indicate the location of a variety of information/data points, including: • Travel times/speeds and/or traffic flow/congestion (Roadway links will be color-coded according to roadway condition.) • Incidents/Events • Roadwork and Other Construction • Lane and Road Closure • Severe Weather • CCTV locations - clicking on a CCTV icon will result in a pop-up window appearing in which the current video (either snapshot or streaming) will be displayed along with a time stamp indicating the time the image was captured. • Locations of DMS - clicking on a DMS icon will result in a pop-up window appearing in which the current text on that DMS is displayed.
ID0010W	WEB150	4.5.4 Map Page	Purpose	The Map Page shall present traffic information (i.e. traffic congestion and speeds, travel times, road conditions and closures, incidents, weather, CCTV and message signs) in both GIS web-based mapping and text-based tables user interfaces..
ID0010W	WEB151	4.5.4 Map Page	Opening View	The opening view of the Map Page is a map of all of Florida shown with an inset map showing the location of the zoomed in area (not zoomed in on opening page).
ID0010W	WEB152	4.5.4 Map Page	Opening View	When the user opens the Map Page and they are logged into the site, the map view is shown and there is a drop down box at the bottom of the legend for the user to select their personal routes.
ID0010W	WEB153	4.5.4Map Page	Opening View	When the user opens the Map Page and they are not logged in, the map view is shown with a view of all of Florida with indicators to select to zoom the user into the District level.

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ID0010W	WEB154	4.5.4 Map Page	Opening View	On the map there is a help hint describing how to move around and zoom into the map. "
ID0010W	WEB155	4.5.4 Map Page	Opening View	Beside the map there is a list entitled "Map Legend" a list of choices for what can be shown on the page.
ID0010W	WEB156	4.5.4 Map Page	Opening View	At the top of the map there are tabs for :"Map", "Events", "Road Signs", Cameras", "Weather", "Travel Times", "My FL511"
ID0010W	WEB157	4.5.4 Map Page	Opening View	On this page there is a drop down box entitled "District" where the user can select a district to zoom the map into.
ID0010W	WEB158	4.5.4 Map Page	Opening View	When the page opens the map is set so that no icons are displayed on the base map.
ID0010W	WEB159	4.5.4 Map Page	District Icon	The base map has a “District” icon shown on the base maps which are located in the middle of each of the Districts in Florida.
ID0010W	WEB160	4.5.4 Map Page	District Icon	When a "District' icon is selected the map zooms into the district level. (Note that event and other icons can only be displayed on a district level map).
ID0010W	WEB161	4.5.4 Map Page	Map Legend	The map legend is a list of items that includes: "Traffic Speeds", "Cameras"," Road Signs", "Weather", then a sub-heading that is called "Events" under which are the items "Incidents", "Road Closures", Road Work" , "Severe Weather" . The map legend continues with “Travel Times” and “My FL511 Travel Times”.
ID0010W	WEB162	4.5.4 Map Page	Map Legend	Each item on the legend has a check box, icon picture and/ icon name .
ID0010W	WE B163	4.5.4 Map Page	Map Legend	The user can check any number of legend items on the legend.
ID0010W	WEB164	4.5.4 Map Page	Map Legend	When the check box is checked for a legend item the selected icons are shown on the current map view.
ID0010W	WEB165	4.5.4 Map Page	Map Legend	The user can uncheck any legend item at any time and the icons for that item will disappear from the map.
ID0010W	WEB166	4.5.4 Map Page	Map Legend - Traffic Speeds	When the "Traffic Speeds" legend item is checked, the highways on the map for which there is travel speed information supplied will be color-coded to represent highway speed.

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ID0010W	WEB167	4.5.4 Map Page	Map Legend - Traffic Speeds	When the "Traffic Speeds" legend item is checked, a drop down legend appears showing the color legend for the highway speeds. There are 3 categories of speeds: Slow, Moderate and Fast, and "No Data". The "No Data" response is for highways where there could be data from the system but no data has been received.
ID0010W	WEB168	4.5.4 Map Page	Map Legend - Traffic Speeds	Speed links shall be color-coded to represent the following scenarios: Slow (Red) Moderate (Yellow) Fast (Green) No Data (Gray).
ID0010W	WEB169	4.5.4 Map Page	Map Legend - Traffic Speeds	When the speed legend is displayed, there is link called "Color Options" which when opened allows the user to choose between 3 different set of color options for the highway speeds. One option is the default option, one option is a range of gray colors and the third option has blue instead of green with the other colors the same.
ID0010W	WEB170	4.5.4 Map Page	Map Legend - Cameras	When the check box beside the legend Item "Cameras" is selected, the camera icons are shown on the map at the locations of all the cameras in the current map view.
ID0010W	WEB171	4.5.4 Map Page	Map Legend - Road Signs	When the check box beside the legend Item "Road Signs" is selected, the Road sign icons are shown on the map at the locations of all the signs in the current map view.
ID0010W	WEB172	4.5.4 Map Page	Map Legend - Weather	When the check box beside the legend Item "Weather" is selected, weather icons are shown on the map at the locations where weather condition information is available.
ID0010W	WEB173	4.5.4 Map Page	Map Legend - Incident	When the check box beside the legend Item "Incident" is selected, the incident icons are shown on the map at the locations of all the incidents in the current map view.
ID0010W	WEB174	4.5.4 Map Page	Map Legend - Road Closures	When the check box beside the legend Item "Road Closures" is selected, the road closures icons are shown on the map at the locations of all the road closures in the current map view.
ID0010W	WEB175	4.5.4 Map Page	Map Legend - Road Work	When the check box beside the legend Item "Road work" is selected, the roadwork icons are shown on the map at the locations of all the roadwork in the current map view.
ID0010W	WEB176	4.5.4 Map Page	Map Legend - Severe Weather	When the check box beside the legend Item "Severe Weather" is selected, the severe weather icons are shown on the map at the locations of all the severe weather events

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				the current map view.
ID0010W	WEB177	4.5.4 Map Page	Map Legend - Travel Times	When the check box beside the legend Item "Travel Times" is selected, the link node icons are shown on the map.
ID0010W	WEB178	4.5.4 Map Page	Map Legend - My FL511 Travel Times	When the check box beside the legend item “My FL511 Travel times” is selected and the user is logged in, the user’s routes appear on the map. If the user is not logged in, there is a tool tip that says the user must be logged in to use this item and the Welcome to MyFL511 page which has a login section.
ID0010W	WEB179	4.5.4 Map Page	Map	The map will be as large as possible on the page given the other requirements on the page.
ID0010W	WEB180	4.5.4 Map Page	Map	The Map Legend column can be hidden from view on the page by pressing the ">>" button. The map will zoom to fill the whole screen with the same map area.
ID0010W	WEB181	4.5.4 Map Page	Insert Map	In one of the 4 corners of the map will be a small inset locator map showing a zoomed out version of the larger map on the page.
ID0010W	WEB182	4.5.4 Map Page	Map Navigation	ON the top of the map will be a help message that describes how to navigate around the map. Suggestion for Google Map: "Use the navigational arrows or click and drag your mouse to shift to the area you're interested in. You may zoom in or out using the slider".
ID0010W	WEB183	4.5.4 Map Page	Map Drop Down	There is a "location" drop down menu at the top of the map for "cities" and "Counties". When one of the locations in the list is chosen the chosen area is shown on the map with all of the checked legend item icons showing.
ID0010W	WEB184	4.5.4 Map Page	Map icons	The map displayed will show icons in the correct location on the map for all of the items in the map legend that have a check mark in the check box beside the item.
ID0010W	WEB185	4.5.4 Map Page	Map waiting	When one of the check boxes is checked while the map is open, during the time it takes to update the map with the correct information there should be a notice shown on the page to indicate that the user should wait because the page is being updated.
ID0010W	WEB186	4.5.4 Map Page	Map –Traffic Speeds	Traffic speed bars are displayed on the map overlaying the highways when the "Traffic Speeds" check box is selected in the Map Legend.

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ID0010W	WEB187	4.5.4 Map Page	Map –Traffic Speeds	The traffic speed bars are color coded in green, yellow and red to identify a range of speed levels.
ID0010W	WEB188	4.5.4 Map Page	Map –Traffic Speeds	When the mouse hovers over or clicks on a road with colored bars, a hover box appears that shows a description of the location (route name and bounding exit names), and the average speed for the link.
ID0010W	WEB189	4.5.4 Map Page	Map –Traffic Speeds	Left clicking on a roadway with a colored traffic bar on it a pop up window is displayed that provides more information about the traffic condition including: description of the location (route name and bounding exit names), a general statement about the traffic, the average speed for the link and the last update date and time.
ID0010W	WEB190	4.5.4 Map Page	Map -Camera	Camera icons are displayed on the map at their actual locations when the Cameras check box is selected in the Map Legend.
ID0010W	WEB191	4.5.4 Map Page	Map -Camera	When the mouse hovers over a camera icon on the map, a small hover box appears that describes the location of the camera and the camera number.
ID0010W	WEB192	4.5.4 Map Page	Map -Camera	Left clicking on a camera icon on a map brings up a pop up window that shows the camera image of the location, a description of the location, the viewing direction and the last refresh date. For streaming image cameras, the user is prompted with their connection speeds. The appropriate streaming quality will be selected corresponding to their selected connection speeds.
ID0010W	WEB193	4.5.4 Map Page	Map -Camera	In districts where the camera images are only available as a video tour, whenever any one camera icon is clicked on, the video tour for that District will be displayed.
ID0010W	WEB194	4.5.4 Map Page	Map -Road Signs	Road sign icons are displayed on the map at their actual locations when the Road Sign check box is selected in the Map Legend.
ID0010W	WEB195	4.5.4 Map Page	Map -Road Signs	When the mouse hovers over a Road sign icon on the map, a small hover box appears that describes the location of the Road sign.
ID0010W	WEB196	4.5.4 Map Page	Map -Road Signs	Left clicking on the Road sign icon brings up a pop up window displays the Road currently being shown on the sign, a description of the location of the sign and the last refresh time.
ID0010W	WEB197	4.5.4 Map Page	Map -Incidents	Incident icons are displayed on the map at their actual locations when the Incident check box is selected in the Map Legend.

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ID0010W	WEB198	4.5.4 Map Page	Map -Incidents	When the mouse hovers over an incident icon on the map, a small hover box appears that describes the location of the incident and a two word short description of the incident
ID0010W	WEB199	4.5.4 Map Page	Map -Incidents	When the mouse left clicks on an incident icon on the map, a pop up window appears that describes the location of the incident and a description of the incident and time until it should clear.
ID0010W	WEB200	4.5.4 Map Page	Map -Road Closures	Road closure icons are displayed on the map at their actual locations when the Road closure check box is selected in the Map Legend.
ID0010W	WEB201	4.5.4 Map Page	Map -Road Closures	When the mouse hovers over a road closure icon on the map, a small hover box appears that describes the location of the closure and a two word description of the closure .
ID0010W	WEB202	4.5.4 Map Page	Map -Road Closures	When the mouse left clicks a lane/road closure icon on the map, a pop up window appears that has a title area that describes the location of the closure and a description of the closure and start and end dates of the closure.
ID0010W	WEB203	4.5.4 Map Page	Map -Roadwork	Roadwork icons are displayed on the map at their actual locations when the Roadwork check box is selected in the Map Legend.
ID0010W	WEB204	4.5.4 Map Page	Map -Roadwork	When the mouse hovers over a roadwork icon on the map, a small hover box appears that describes the location of the roadwork and a two word description of the work being done.
ID0010W	WEB205	4.5.4 Map Page	Map -Roadwork	When the mouse left clicks on a roadwork icon on the map, a pop up window is displayed that describes the location of the roadwork and a short description of the work being done and start and end dates of the roadwork.
ID0010W	WEB206	Map Page	Map – Severe Weather	Severe weather icons are displayed on the map at their actual locations when the Severe Weather check box is selected in the Map Legend.
ID0010W	WEB207	4.5.4 Map Page	Map – Severe Weather	When the mouse hovers on a weather icon on the map, a small hover box appears that describes the location of the severe weather and a two word description of the severe weather
ID0010W	WEB208	4.5.4 Map Page	Map – Severe Weather	When the mouse left clicks on a weather icon on the map, a pop up window is displayed that describes the location of the severe weather and a short description of

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				the severe weather and the duration of the severe weather warning.
ID0010W	WEB209	4.5.4 Map Page	Map – Travel Times	When the Travel Times check box is selected in the Map Legend link icons are shown at every node in the highway system
ID0010W	WEB210	4.5.4 Map Page	Map – Travel Times	When the mouse hovers on a link in the highway system, the name of the link is shown in a hover box (Route name and node names), and the travel time for the link.
ID0010W	WEB211	4.5.4 Map Page	Map – Travel Times	When the mouse left clicks on a link in the highway a pop up window is displayed that describes the link (route and nodes) , gives the travel time on the link and the average speed and distance of the link.
ID0010W	WEB212	4.5.4 Map Page	Map – My FL511 Travel Times	When the My FL511 check box is selected, all of the registered user's routes are shown on the map color-coded by traffic speed (green, yellow, red or gray) and the travel times, distance, avg. speed, and delay for all the routes are shown in a pop up box.
ID0010W	WEB213	4.5.4 Map Page	Map – My FL511 Travel Times	There is a drop down box under the "MyFL511 Travel Times" item that allows the user to select one of their routes for display.
ID0010W	WEB214	4.5.4 Map Page	Map – My FL511 Travel Times	If the user selects one route to be displayed using the drop down box, only that route will be shown on the map, color –code by link speed.
ID0010W	WEB215	4.5.4 Map Page	Map – My FL511 Travel Times	If the user clicks the mouse over a route link and selects the route link marker, route information including" travel time, distance, avg. speed, and delay are shown in a pop-up box.
ID0010W	WEB216	4.5.4 Map Page	Map – My FL511 Travel Times	When the My FL511 check box is selected the Travel Times checkbox defaults to being checked and cannot be unchecked by the user.
ID0010W	WEB217	4.5.4 Map Page	Tabs	When the mouse hovers over the tabs at the top of the map, a hover box is displayed that briefly describes the content of the tab:
ID0010W	WEB218	4.5.4 Map Page	Tabs	When the Map tab is selected the 4.3.4.5.4 Map Page is displayed with the map visible on the page.
ID0010W	WEB219	4.5.4 Map Page	Tabs	When the Event tab is selected, the Event List Page is displayed that shows lists for Incidents, Road Closures, Road Work and Severe Weather.

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ID0010W	WEB220	4.5.4 Map Page	Tabs	When the Road Signs tab is selected, the "Road List Page" is displayed that shows lists of all Road signs.
ID0010W	WEB221	4.5.4 Map Page	Tabs	When the Camera tab is selected, the "Camera List Page" is displayed that shows lists of all cameras in the system.
ID0010W	WEB222	4.5.4 Map Page	Tabs	When the Weather tab is selected, the "Weather List Page" is displayed that shows lists of weather conditions.
ID0010W	WEB223	4.5.4 Map Page	Tabs	When the Travel Times tab is selected, the "Travel Time List Page" is displayed that shows lists of all highway links and their associated travel times.
ID0010W	WEB224	4.5.4 Map Page	Tabs	When the My FL511 tab is selected, if the user is not logged into the site, the "Welcome to My FL511 page is shown that allows the user to login in if they are already registered or else from there they can go to the MY52 Profile page to register onto the site. If the user is already registered, the "My FL511 Page" is displayed.
ID0010W	WEB250	4.5.5 Event Text Page	Purpose	The Event Text page shows lists of information about Incidents, Road Closures, Road Work and Severe Weather.
ID0010W	WEB251	4.5.5 Event Text Page	Opening View	When the user opens the "Event List Page" the tabs ("Map", "Events", "Road Signs", Cameras", "Weather", "Travel Times", "My FL511") continue to be displayed.
ID0010W	WEB252	4.5.5 Event Text Page	Opening View	The opening view for the page shows a list of all possible events sorted first by incident type.
ID0010W	WEB254	4.5.5 Event Text Page	View	The page displays a list of events with the headings :Start/End Date, Event Type, Severity, City/County, Description, current status
ID0010W	WEB255	4.5.5 Event Text Page	Filters	There are filter drop down boxes for Date, Event Type (Incidents, Road Closures, Road Work, Severe Weather, All, Date, Event Severity (Urgent, Critical, Important Routine All)), District
ID0010W	WEB256	4.5.5 Event Text Page	Filters	The user can select from one or more filter drop down boxes.
ID0010W	WEB257	4.5.5 Event Text Page	List	The information is displayed based on the filters used.
ID0010W	WEB270	4.5.6 Road Signs	Purpose	The Road Signs List Page shows a list of all Road signs, their location and the current

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		Page		Road.
ID0010W	WEB271	4.5.6 Road Signs Page	Opening View	When the user opens the "Road Signs List Page" the tabs ("Map", "Events", "Road Signs", Cameras", "Weather", "Travel Times", "My FL511") continue to be displayed.
ID0010W	WEB272	4.5.6 Road Signs Page	Opening View	The opening view for the page shows a list of all road signs sorted first by location.
ID0010W	WEB274	4.5.6 Road Signs Page	View	The page displays a list of Road signs with the headings :Road Sign ID, Location, Current Road.
ID0010W	WEB275	4.5.6 Road Signs Page	Filters	There is one filter drop down box for District.
ID0010W	WEB276	4.5.6 Road Signs Page	Filters	The user can select from one or no filter drop down boxes.
ID0010W	WEB277	4.5.6 Road Signs Page	List	The information is displayed based on the filters used and.
ID0010W	WEB290	4.5.7 Camera Text Page	Purpose	The Camera List Page shows a list of all CCTV cameras, their ID, location and a view from the camera.
ID0010W	WEB291	4.5.7 Camera Text Page	Opening View	When the user opens the Camera List Page the tabs ("Map", "Events", "Road Signs", Cameras", "Weather", "Travel Times", "My FL511") continue to be displayed.
ID0010W	WEB292	4.5.7 Camera Text Page	Opening View	The opening view for the page shows a list of all cameras sorted first by location.
ID0010W	WEB294	4.5.7 Camera Text Page	View	The page displays a list of cameras with the headings Camera ID, Location (Highway and Direction of view), Snapshot/Stream.
ID0010W	WEB295	4.5.7 Camera Text Page	Filters	There are 2 filter drop-down boxes: District and Highway.
ID0010W	WEB296	4.5.7 Camera Text Page	Filters	The user can select from one or no filter drop down boxes.
ID0010W	WEB297	4.5.7 Camera Text Page	List	The information is displayed based on the filters used.

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ID0010W	WEB298	4.5.7 Camera Text Page	Link to camera	There is a link associated with every camera to open the camera view.
ID0010W	WEB299	4.5.7 Camera Text Page	Minimum number	The number of camera video selectable by the user is a minimum of 600 CCTV's
ID0010W	WEB330	4.5.8 Travel Time Page	Purpose	The Travel Times List page shows traffic information for a list of roadway segments.
ID0010W	WEB331	4.5.8 Travel Time Page	Opening View	When the user opens the "Travel Time List Page" the tabs ("Map", "Events", "Road Signs", Cameras", "Weather", "Travel Times", "My FL511") continue to be displayed.
ID0010W	WEB332	4.5.8 Travel Time Page	Opening View	The opening view for the page shows a list of all possible link segments.
ID0010W	WEB334	4.5.8 Travel Time Page	View	The page displays a list of events with the headings :Route Name, Segment, Distance, Travel Time, Average Speed, Delay Time
ID0010W	WEB335	4.5.8 Travel Time Page	Filters	There are filter drop down boxes for District, Highway and Highway Segment.
ID0010W	WEB336	4.5.8 Travel Time Page	Filters	The user can select from one or more filters drop down boxes.
ID0010W	WEB337	4.5.8 Travel Time Page	List	The information is displayed based on the filters used.
ID0010W	WEB338	4.5.8 Travel Time Page		The website provides travel times for alternate routes as specified by FDOT and available through SunGuide.
ID0010W	WEB360	4.5.9 My FL511 Page	Purpose	The My FL511 Page shows traffic information for a registered user'.
ID0010W	WEB361	4.5.9 My FL511 Page	Opening View	When the user opens the "My FL511 Traffic List Page" the tabs ("Map", "Events", "Road Signs", Cameras", "Weather", "Travel Times", "My FL511") continue to be displayed.
ID0010W	WEB362	4.5.9 My FL511 Page	Opening View	The opening view for the page shows a list of all possible routes sorted first by Route Name. A drop down box is available when the user hovers or clicks a route, that shows information for each segment of the route.

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ID0010W	WEB364	4.5.9 My FL511 Page	View	The page displays information for all the segments of one registered user's options with the headings: Segment Name, Distance, Travel Time, Average Speed and Delay.
ID0010W	WEB365	4.5.9 My FL511 Page	Filters	There is filter drop down box for Route Name.
ID0010W	WEB366	4.5.9 My FL511 Page	List	When a user selects a Route from the filter drop down box, only that route is listed on the page and the user can hover or click on the route to segment information.
ID010W1				Clicking on or mouse over any of the icons or other data elements listed above shall result in a pop-up window that displays more detailed information.
ID010W1	WEB188	4.5.4 Map Page	Map -Traffic Speeds	When the mouse hovers over or clicks on a road with colored bars, a hover box appears that shows a description of the location (route name and bounding exit names), and the average speed for the link.
ID010W1	WEB189	4.5.4 Map Page	Map -Traffic Speeds	Left clicking on a roadway with a colored traffic bar on it a pop up window is displayed that provides more information about the traffic condition including: description of the location (route name and bounding exit names), a general statement about the traffic, the average speed for the link and the last update date and time.
ID010W1	WEB191	4.5.4 Map Page	Map – Cameras	When the mouse hovers over a camera icon on the map, a small hover box appears that describes the location of the camera and the camera number.
ID010W1	WEB192	4.5.4 Map Page	Map –Cameras	Left clicking on a camera icon on a map brings up a pop up window that shows the camera image of the location, a description of the location, the viewing direction and the last refresh date. For streaming image cameras, the user is prompted with their connection speeds if the user has not already logged in and set up a connection speed preference profile. The appropriate streaming quality will be selected corresponding to their selected connection speeds.
ID010W1	WEB195	4.5.4 Map Page	Map-Road Signs	When the mouse hovers over a Road sign icon on the map, a small hover box appears that describes the location of the Road sign.
ID010W1	WEB196	4.5.4 Map Page	Map – Road Signs	Left clicking on the Road sign icon brings up a pop up window that displays the Road currently being shown on the sign, a description of the location of the sign and the last refresh time.

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ID010W1	WEB198	4.5.4 Map Page	Map – Incidents	When the mouse hovers over an incident icon on the map, a small hover box appears that describes the location of the incident and a two word short description of the incident
ID010W1	WEB199	4.5.4 Map Page	Map - Incidents	When the mouse left clicks on an incident icon on the map, a pop up window appears that describes the location of the incident and a description of the incident and time until it should clear.
ID010W1	WEB201	4.5.4 Map Page	Map – Road Closures	When the mouse hovers over a road closure icon on the map, a small hover box appears that describes the location of the closure and a two word description of the closure.
ID010W1	WEB202	4.5.4 Map Page	Map – Road Closures	When the mouse left clicks a lane/road closure icon on the map, a pop up window appears that describes the location of the closure and a description of the closure and start and end dates of the closure.
ID010W1	WEB204	4.5.4 Map Page	Map – Roadwork	When the mouse hovers over a roadwork icon on the map, a small hover box appears that describes the location of the roadwork and a two word description of the work being done.
ID010W1	WEB205	4.5.4 Map Page	Map – Roadwork	When the mouse left clicks on a roadwork icon on the map, a pop up window is displayed that describes the location of the roadwork and a short description of the work being done and start and end dates of the roadwork.
ID010W1	WEB207	4.5.4 Map Page	Map – Severe Weather	When the mouse hovers on a weather icon on the map, a small hover box appears that describes the location of the severe weather and a two word description of the severe weather
ID010W1	WEB208	4.5.4 Map Page	Map – Severe Weather	When the mouse left clicks on a weather icon on the map, a pop up window is displayed that describes the location of the severe weather and a short description of the severe weather and the duration of the severe weather warning.
ID010W1	WEB210	4.5.4 Map Page	Map – Travel Times	When the mouse hovers on a link in the highway system, the name of the link is shown in a hover box (Route name and node names), and the travel time for the link.
ID010W1	WEB211	4.5.4 Map Page	Map – Travel Times	When the mouse left clicks on a link in the highway a pop up window is displayed that describes the link (route and nodes) , gives the travel time on the link and the average speed and distance of the link.

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ID010W2				Clicking on a CCTV icon shall display the current image for that camera.
ID010W2	WEB192	4.5.4 Map Page	Map – Cameras	Left clicking on a camera icon on a map brings up a pop up window that shows the camera image or streaming image of the location, a description of the location, the viewing direction and the last refresh date. For streaming image cameras, the user is prompted with their connection speeds if the user has not already logged in and set up a connection speed preference profile. The appropriate streaming quality will be selected corresponding to their selected connection speeds
ID010W2	WEB193	4.5.4 Map Page	Map –Cameras	In districts where the camera images are only available as a video tour, whenever any one camera icon is clicked on, the video tour for that District will be displayed.
ID010W3				A separate section of the ATIS Web site shall contain a click-able list of cameras and their Locations.
ID010W3	WEB290	4.5.7 Camera Text Page	Purpose	The Camera List Page allows the user to see a list of click-able camera locations.
ID010W3	WEB291	4.5.7 Camera Text Page	Opening View	When the user opens the Camera List Page the tabs ("Map", "Events", "Road Signs", Cameras", "Weather", "Travel Times", "My FL511") continue to be displayed.
ID010W3	WEB292	4.5.7 Camera Text Page	Opening View	The opening view for the page shows a list of all cameras sorted first by location.
ID010W3	WEB294	4.5.7 Camera Text Page	View	The page displays a list of cameras with the headings: Camera ID, Location (Highway and Direction of view), Snapshot/Stream.
ID010W3	WEB295	4.5.7 Camera Text Page	Filters	There are 2 filter drop-down boxes: District and Highway.
ID010W3	WEB296	4.5.7 Camera Text Page	List	The user can select from one or no filter drop down boxes.
ID010W3	WEB297	4.5.7 Camera Text Page	List	The information is displayed based on the filters used.
ID010W3	WEB298	4.5.7 Camera Text Page	Link to camera	In the list there is a real time image provided for sites where there is a still image camera. For locations that provide streaming video there is a link provided with instructions to open the link and see the video.

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ID010W4				A legend of all illustrations (e.g., color coding of links and icon definitions) shall be available on the same page as the map.
ID010W4	WEB168	4.5.4 Map Page	Legend – Traffic Speeds	When the "Traffic Speeds" legend item is checked, a drop down legend appears showing the color legend for the highway speeds. There are 3 categories of speeds: Slow, Moderate and Fast, and "No Data". The "No Data" response is for highways where there could be data from the system but no data has been received.
ID010W5				The website shall provide travel times for alternative routes specified by FDOT.
ID010W5	WEB338	4.5.8 Travel Time Page	Alternate Routes	The website shall provide travel times for alternate routes as specified by FDOT and available through SunGuide.
ID010W6				For Districts that provide a video tour rather than video from user selected CCTV, the web site shall provide a “video tour” option for that District on the web site.
ID010W6	WEB193	4.5.4 Map Page	Map - Cameras	In districts where the camera images are only available as a video tour, whenever any one camera icon is clicked on, the video tour for that District will be displayed.
ID010W7				The website shall provide camera images as specified by FDOT.
ID010W7		4.3.2.3.3 511 Main Website		The website will provide static camera images as specified by FDOT.
ID010W7		7.4.2 Image Distribution		An administrator will have the capability to block camera images.
ID010W8				The website shall be able to expand the number of camera video that is selectable by the user to a minimum of 600 CCTVs.
ID010W8	WEB299	4.5.7 Camera Text Page		The number of camera video selectable by the user is a minimum of 600 CCTV's
ID011W				The web page shall be accessible through WAP enabled cell phones or similar PDA type devices.
ID011W	WEB450	WAP Page		A separate web page shall cater to WAP/PDA users via Wireless Markup Language (WML) and .NET Mobile User Controls.

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ID011W	WEB451	WAP Page		WAP/PDA web page shall present all traffic information with text only
ID011W	WEB452	WAP Page		WAP/PDA web page shall have navigational hyperlinks on the top of Every Page and disclaimers on the bottom of Every Page.
ID012W				The Website shall enable users to view a set of active traffic incidents and events that can be filtered according to incident/event severity (i.e., Urgent, Critical, Important, Routine or all incidents) and region/city where they are occurring
ID0012W	WEB255	4.5.5 Event List Page	Filters	There are filter drop down boxes for Date, Event Type (Incidents, Road Closures, Road Work, Severe Weather, All, Date, Event Severity (Urgent, Critical, Important Routine All)), District
ID013W				The Web site shall have information concerning terms of service, disclaimers, and user privacy.
ID013W	WEB33	4.5.2 Every Page	Disclaimer	There is link to a Disclaimer Page, which describes the terms of service, disclaimers and user privacy.
ID013W1				The web disclaimer shall focus on the personalized aspects of the Web site/511 system for which personal information is collected.
ID013W1	WEB33	4.5.2 Every Page	Disclaimer	There is link to a Disclaimer Page, which describes the terms of service, disclaimers and user privacy.
ID014W				The Web site component must have an operational availability annually of at least 99.95% measured over an operating cycle of 24 hours starting at local midnight.
ID015W				The ATIS Web site shall provide a usage monitoring capability to obtain information about patterns of usage on different parts of the Web site.
ID015W1				The following usage data shall be able to be reported for the web site: • Number of Monthly Unique Visitors • Number of Monthly Page Views • Number of Peak Unique Visitors per Day

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				• Number of Peak Unique Visitors Total to date • Number of Peak Page Views per Day • Number of Peak Page View Total to date • Percentage of hits per web category/feature: - Camera Views - Construction - Ferry - No Selection / Information - Other Language - Road Conditions - Segment Reports - Traffic - Transfers - Links to Other Agencies - Travel Times • Website Comments (number) - Positive - Negative - Suggestions
ID015W2				The format of the reports shall be as specified by FDOT.
ID015W	WEB500	4.4.3.3 Administrative Portal	Purpose	Provide secure Internet access to FLATIS on-line management services including IVR & website analytics reporting, Quality Management System reporting.
ID015W	WEB501	4.4.3.3 Administrative	Login	The Administrative Portal will provide a log-in screen that allows users to log-in using a username and password.

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		Portal		
ID015W	WEB502	4.4.3.3 Administrative Portal	Login	The Administrative Portal will provide two levels of security: (i) for administrators who have the ability to create new accounts and access all features of the Administrative Portal, and (ii) all other users will have similar access to the services with the exception of the creation of new accounts.
ID015W	WEB503	4.4.3.3 Administrative Portal	Login	Access will require a high-speed bandwidth, and MINIMUM BROWSER LEVEL, or later.
ID015W	WEB504	Opening Page	Opening View	The opening page of the Administrative Portal will feature a list of services of services that the user will be able to access, including: IVR Statistics Reporting; Website Statistics Reporting; System Health Reporting; Data Tracking Reporting; Floodgate Management; Personalization Management
ID015W	WEB505	8.6.1 Opening Page	Opening Page	This list of services will be presented as a list of navigable links. Clicking on any one of these links will send the user to the corresponding service.
ID015W	WEB506	8.6.1 Opening Page	Opening Page	The Administrative Portal will identify the current data and time
ID015W	WEB507	8.6.1 Opening Page	View	Clicking on the 'IVR Statistics Reporting' link will send the user to the LogicTree IVR reporting page.
ID015W	WEB508	8.6.1 Opening Page	View	Clicking on the 'Website Statistics Reporting' link will send the user to the IBI Group website reporting page.
ID015W	WEB509	8.6.1 Opening Page	View	Clicking on the 'System Health Reporting' link will send the user to the SiteScope management tool.
ID015W	WEB510	8.6.1 Opening	View	Clicking on the 'Data Tracking Reporting' link will send the user to the data tracking

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		Page		reporting page to be developed by IBI Group.
ID015W	WEB511	8.6.1 Opening Page	View	Clicking on the 'Floodgate Management' link will send the user to the LogicTree floodgate management tool.
ID015W	WEB512	8.6.1 Opening Page	View	The Administrative Portal will identify the current data and time
ID015W	WEB513	8.6.1 Opening Page	View	The Administrative Portal will provide a toggle for operator use in English and Spanish.
ID015W	WEB514	8.6.1 Opening Page	View	The Administrative Portal will provide a link to the 511 website.
ID015W	WEB515	8.6.1 Opening Page	View	The Administrative Portal will provide on-line help and a user feedback link that will allow the user to send an email to the LogicTree-IBI Group team.
ID016W				The ATIS Web site shall be bilingual providing a language option for either English or Spanish.
ID016W	WEB51	4.5.2 Every Page	Language Option	Every Page has a toggle to switch languages between English and Spanish.
ID016W	WEB52	4.5.2 Every Page	Language Option	Both the words "English" and "Espanola" are displayed. The current language being used on the site is highlighted.
ID016W	WEB53	4.5.2 Every Page	Language Option	When the language is changed, the page being viewed and all subsequent pages viewed in this visit to the site are in the new language.
ID016W1				The web site shall allow a user to configure the web site for either English or Spanish so that when the user logs in to the web site in the future the selected language is used.
ID016W1	WEB409	4.5.13 My FL511 Personalization	Language option	A user can personalize the site such that when they log into the site, they have the option to save their language setting such that when they return to the site, their saved language will be in effect.
ID016W1	WEB411	4.5.16 My FL 511 Profile Page	Language	The language chosen on the Profile page will become the language that is in effect when the user opens the site.

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ID016W2				The web site default language shall be English.
ID016W2	WEB01	4.5.2 Every Page	Language option	The default language for the website is English
ID016W3				The web site shall provide information that is the same level of detail and accuracy on both the Spanish language version and the English language version.
ID016W3	WEB02	4.5.2 Every Page	Language detail	The English and Spanish versions of the website will be identical in the level of detail and accuracy. The website shall provide the same level of detail and accuracy on both the Spanish and English language versions for dynamic data when available through the DFS.
ID017W				The ATIS Web site shall be standards based and avoid the use of proprietary applications.
ID017W	WEB29	4.3.1 Design Rationale		Web shall comply with W3C Standards (HTML, CSS, JavaScript, etc) for all web pages.
ID018W				The ATIS Web site shall be developed so that it is flexible and scaleable to allow the addition/modification of various data elements (e.g., adding new roads and/or changing road segments) without the need for major system redesign.
ID019W				The Web site component shall receive aggregated camera image data from the video aggregation subsystem for access through the website.
ID019W1				The web site shall provide CCTV icons that show the location of CCTV cameras that can be used to access images from that camera.
ID019W1	WEB170	4.5.4 Map Page	Map Legend - Cameras	When the check box beside the legend Item "Cameras" is selected, the camera icons are shown on the map at the locations of all the cameras in the current map view.
ID019W1	WEB190	4.5.4 Map Page	Map – Cameras	Camera icons are displayed on the map at their actual locations when the Cameras check box is selected in the Map Legend.

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ID019W1	WEB191	4.5.4 Map Page	Map - Cameras	When the mouse hovers over a camera icon on the map, a small hover box appears that describes the location of the camera and the camera number.
ID019W1	WEB192	4.5.4 Map Page	Map - Cameras	Left clicking on a camera icon on a map brings up a pop up window that shows the camera image or streaming image of the location, a description of the location, the viewing direction and the last refresh date. For streaming image cameras, the user is prompted with their connection speeds if the user has not already logged in and set up a connection speed preference profile. The appropriate streaming quality will be selected corresponding to their selected connection speeds
ID019W2				The web site shall allow the user to specify the connection speed they are using.
ID019W2	WEB192	4.5.4 Map Page	Map - Cameras	Left clicking on a camera icon on a map brings up a pop up window that shows the camera image or streaming image of the location, a description of the location, the viewing direction and the last refresh date. For streaming image cameras, the user is prompted with their connection speeds if the user has not already logged in and set up a connection speed preference profile. The appropriate streaming quality will be selected corresponding to their selected connection speeds
ID019W3				The web site shall modify the type of camera images displayed depending on the user's connection speed.
ID019W3	WEB192	4.5.4 Map Page	Map - Cameras	Left clicking on a camera icon on a map brings up a pop up window that shows the camera image or streaming image of the location, a description of the location, the viewing direction and the last refresh date. For streaming image cameras, the user is prompted with their connection speeds if the user has not already logged in and set up a connection speed preference profile. The appropriate streaming quality will be selected corresponding to their selected connection speeds
ID020W				Under special situations, such as during evacuations, more detailed information, such as evacuation route information (links to information), shall be provided on the Web site.
ID020W	WEB516	8.6.1 Opening Page	Evacuation	Administrators shall be able to add detailed evacuations information in the Content Management System.
ID020W	WEB47	4.5.2 Every Page	Hyperlink –	When the Evacuation hyperlink is selected from any page - information and links to

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			Evacuation	evacuation sites is provided.
ID021W				The web site component shall provide travel times between user selectable origin/destination pairs identified on the web map.
ID021W	WEB403	4.5.16 My FI511 Profile Page	Modify Routes	The Personalization Page provides the means for a registered user to add and modify an unlimited number of travel profiles where the travel profile is a route built segment by segment.
ID022W				The web site shall offer personalized travel information based on the user's login and associated pre-defined preferences that are part of their profile.
ID022W	WEB109	4.5.3 Home Page	Personal Login	On the Home Page there is a location for logging into the site to retrieve personalized information.
ID022W	WEB110	4.5.3 Home Page	Personal Login	The login area is introduced with a message: "You can receive personalized transportation information from Florida 511 - on the website, by telephone, on your PDA or cell phone."
ID023W				The web site shall display the current date and time received from the IDS.
ID023W1				As a configurable option at the District level, delay times may be displayed instead of travel times.
ID023W1	WEB334	4.5.8 Travel Time Page	View	The page displays a list of events with the headings: Route Name, Segment, Distance, Travel Time, Average Speed, Delay Time
ID024W				The web site shall have an option for a printer friendly version of the currently viewed page that does not exceed 600 pixels in width.
ID024W	WEB59	4.5.2 Every Page	Printer	On Every Page there will be a link called "Printer Friendly". When clicked, a preview page will appear that shows what would be printed. This will be a clean version of the page with only the important information and images.
ID024W	WEB60	4.5.2 Every Page	Printer	The page printed does not exceed 600 pixels in width.

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Video Aggregation Subsystem (VAS)				
VA001				The third party feed shall provide access to selected camera images available from the Districts.
VA001	VAS01	7.3 VAS Architecture	VAS	The Image Server will retrieve camera images from the districts.
VA001	VAS02	7.3 VAS Architecture	VAS	The Image Server shall be able to access images in a folder on the district server via FTP.
VA001	VAS03	7.3 VAS Architecture	VAS	The Image Server will publish the images on the web server image directory.
VA001				The DFS will communicate what cameras are to be blocked for public viewing.
	VAS04	7.3 VAS Architecture	VAS	The web IDS will receive camera status and blocked image status via the C2C Plug-in
VA002				The FLATIS shall provide video to the Website Component and third parties.
VA002	VAS05	7.3 VAS Architecture	VAS	FLATIS will provide video to the website via the Real Network Helix Servers.
VA003				It shall be possible to block specific camera images being available to the web site or selected third party VARs through SunGuide operator commands from the Data Fusion Subsystem.
VA003	VAS06	7.3 VAS Architecture	VAS	The web IDS will receive camera status and blocked image status via the C2C Plug-in
VA003				The website will block camera images as specified by information received via the DFS.
VA003	VAS07	7.3 VAS Architecture	VAS	The web IDS will receive camera status and blocked image status via the C2C Plug-in
VA003	VAS08	7.3 VAS Architecture	VAS	The web IDS will display a message to the user indicating that the image is not available.

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VA004				The video aggregation subsystem shall accept digital disaggregated video from all District RTMCs and the Florida Turnpike Enterprise RTMC.
VA004	VAS09	7.3 VAS Architecture	VAS	The VAS will be capable of accepting digital disaggregated MPEG4 video from multiple FDOT Traffic Management Centers.
VA005				The video aggregation component shall provide a way for web site users to select a CCTV camera to view images from the camera on the website.
VA005	VAS10	7.3 VAS Architecture	VAS	Users will be able to select a camera icon on the map to display CCTV images or feeds on the website.
VA005	VAS11	7.3 VAS Architecture	VAS	Video feeds will be displayed to the user using Real Network software.
VA005	VAS12	7.3 VAS Architecture	VAS	CCTV images and feeds will be available to the user in the CCTV list page.
VA006				A progress bar or equivalent representation shall be displayed to indicate the progress of the video stream download after the CCTV is selected until the video stream is displayed.
VA006	VAS13	7.3 VAS Architecture	VAS	A progress bar will be displayed indicating video buffer status until the video stream is displayed
VA007				The third party video feed shall have a published interface.
VA008				The Video Aggregation Subsystem shall provide camera images as specified by FDOT.
VA008	VAS15	7.3 VAS Architecture	VAS	The VAS will provide images as specified by FDOT.
VA009				The Video Aggregation subsystem availability shall have an operational availability annually of at least 99.93% over an operating cycle of 24 hours starting at midnight.
VA010				The Video Aggregation subsystem shall be synchronized to a universal time standard obtained through the internet.
VA011				The Video Aggregation subsystem shall operate normally in a sheltered environment

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				with a controlled temperature ranging from 60 degrees Fahrenheit (° F) to 90° F, and a no condensing humidity ranging from 30 percent to 80 percent
VA012				The Video Aggregation Subsystem shall be able to expand the number of camera video that is selectable by the user to a minimum of 600 CCTVs.
VA012	VAS16	7.3 VAS Architecture	VAS	The Video Aggregation Subsystem will initially support 20 CCTVs, but will be scalable to allow for expansion to 600 CCTV.
Quality Management Server				
QM001				FLATIS data shall be saved and time stamped in the Quality Management subsystem.
QM001	QMS01	8 QMS	QMS	The FLATIS database will save and timestamp all data received via the C2C Plug-in.
QM001	QMS02	8 QMS	QMS	The QMS will have access to time stamped data for reporting.
QM002				The Quality management subsystem shall provide remote access and alerting for hardware components. • Network Health • Disk status • Application status• Usage Warnings (i.e. system approaching levels where queuing is necessary)• Hammer call alerts
QM002	QMS03	8 QMS	QMS	The FLATIS Administrative portal will provide administrators with the ability to remotely access the QMS subsystem.
QM002	QMS04	8 QMS	QMS	The QMS will provide alerts when status levels are critical for the following: Network Health Disk Status Disk Space Application Status (Oracle DB)
QM003				The Quality management subsystem shall log the date/time when an incident report is received into the system and the date/time the information about that incident is

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				available in the IVR for callers and when it is on the web site.
QM003	QMS04	8 QMS	QMS	The QMS will provide reports showing data latency. This will graphically show the time when data is received via the C2C Plug-in and the time when it is displayed on the web.
QM004				The Quality Management subsystem shall provide the ability to see a graphical representation of the system status and latency.
QM004	QMS05	8 QMS	QMS	The QMS will provide reports showing data latency. This will graphically show the time when data is received via the C2C Plug-in and the time when it is displayed on the web.
QM004	QMS06	8 QMS	QMS	The QMS will provide graphic reports displaying website latency.
QM005				The Quality Management subsystem shall provide the ability to see a graphical representation of the system status and latency.
QM005	QMS07	8 QMS	QMS	The FLATIS web IDS will provide administrator access to graphical reports via the administrative portal.
QM006				The information dissemination subsystem shall be able to generate reports based on data saved.
QM006	QMS08	8 QMS	QMS	The FLATIS web IDS will provide administrator access to graphical reports via the administrative portal.
QM007				The Quality Management subsystem shall be synchronized to a universal time standard obtained through the internet.
QM007	QMS09	8 QMS	QMS	The QMS will be synchronized to a universal time standard.
QM008				The Quality Management Subsystem shall be able to, automatically to the maximum extent possible, monitor and report the FLATIS performance including system component availability.
QM008	QMS10	8 QMS	QMS	The QMS will be able to monitor and report on FLATIS web performance and availability.

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QM008	QMS11	8 QMS	QMS	The QMS will be able to monitor Network status and availability to all servers in FLATIS accessible via ping.
QM009				Quality Assurance subsystem shall monitor the third party data feed the IDS output and send an alert if there are any discrepancies between the third party data feed and the information output by the IDS.
QM009	QMS12	8 QMS	QMS	The QMS will be able to monitor Network status and availability to all servers in FLATIS accessible via ping.
QM001F				The Quality Management Subsystem shall be able to, automatically to the maximum extent possible, monitor and report the availability of the Data Fusion Subsystem.
QM001F	QMS13	8 QMS	QMS	The QMS will be able to monitor Network status and availability to all servers in FLATIS accessible via ping.
QM001F1				The Quality Management Subsystem shall be able to, automatically to the maximum extent possible, monitor and report availability of the Center-to-Center communications link.
QM001F1	QMS14	8 QMS	WMS	The QMS will be able to monitor Network status and availability to all servers in FLATIS accessible via ping.
QM001I				The Quality Management Subsystem shall be able to, automatically to the maximum extent possible, monitor and report the availability of the Information Dissemination Subsystem.
QM001I	QMS15	8 QMS		The QMS will be able to monitor Network status and availability to all servers in FLATIS accessible via ping.
QM001I				The Quality Management Subsystem shall be able to, automatically to the maximum extent possible, monitor and report the availability of the IVR component.
QM001I	QMS16	8 QMS	QMS	The QMS will be able to monitor Network status and availability to all servers in FLATIS accessible via ping.
QM001I2				The Quality Management Subsystem shall be able to, automatically to the maximum extent possible, monitor and report the availability of the web component.
QM001I2	QMS17	8 QMS	QMS	The QMS will be able to monitor Network status and availability to all servers in

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				FLATIS accessible via ping.
QM001V				The Quality Management Subsystem shall be able to, automatically to the maximum extent possible, monitor and report the availability of the Video Aggregation Subsystem.
QM001V	QMS18	8 QMS	QMS	The QMS will be able to monitor Network status and availability to all servers in FLATIS accessible via ping.
Personalization				
ID001P				Personalized traveler Information Delivery shall be based on settings provided by subscribers.
ID001P	WEB400	4.5.13 My FL511 Personalization	Display	The user can set up the website to provide a personalized view with respect to language of the site, map display, routes
ID001P1				Subscribers who have registered with FDOT may obtain a User ID and PIN to access their account and establish or edit their travel profile.
ID001P1	WEB401	4.5.14 Welcome to My FL511 Page	Welcome	My FL511 Welcome/Login Page provides information to the user about the use of the personalization portion of the site.
ID001P1	WEB402	4.5.14 Welcome to My FL511 Page	Login	MY FL511 Welcome/Login Page has a section that allows the user to Login to MY FL511 by entering their Username and Password. If the user has forgotten their password, they are able to retrieve their password from this page.
ID001P1	WEB405	4.5.14 Welcome to My FL511 Page	Register	From the My FL511 Welcome/Login Page, new users can select "Sign Up' and the "My FL511 Profile page will be displayed which allows the user to register.
ID001P1	WEB406	4.5.16 My FL511 Profile Page	Personal Information	The My FL511 Profile Page provides the means for a new user to register their personal information and get a User ID and PIN to allow them to create an account.
ID001P1	WEB407	4.5.16 My FL511 Profile Page	Personal Information	Personal information includes a Username, Password, Password confirmation, email address, email address confirmation, primary and secondary phone numbers, language preference and secret question and answer.
ID001P1	WEB408	4.5.16 My FL511 Profile Page	Modify Profiles	The My FL511 Profile Page provides the means for a registered user to modify their personal information.

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ID001P1	WEB409	4.5.16 My FL511 Profile Page	No. of contacts	Subscribers can request alerts be transmitted to them using up to 2 email addresses and/or 2 telephone numbers (SMS and phone)
ID001P1	WEB410	4.5.16 My FL511 Profile Page	Encryption	Personal information the customer account files shall be encrypted with access restricted to system managers.
ID001P1	WEB41	4.5.16 My FL511 Profile Page	Language	The language chosen on the Profile page will become the language that is in effect when the user opens the site.
ID001P1	WEB412	4.5.16 My FL511 Profile Page	Database	The information entered in the Page is used to establish and manage accounts in the IDS database component
ID001P2				The public shall be able to register for personalized traveler information through the web site.
ID001P2	WEB406	4.5.16 My FL511 Profile Page	Personal Information	The My FL511 Profile Page provides the means for a new user to register their personal information and get a User ID and PIN to allow them to create an account.
ID001P2	WEB415	4.5.15 My FL511 Menu Page	Menu content	User can select from the available options for personalization: edit profile, manage routes, manage alerts
ID002P				The Personalization Component shall establish and manage subscriber accounts in the IDS database component
ID002P	WEB412	4.5.16 My FL511 Profile Page	Database	The information entered in the Page is used to establish and manage accounts in the IDS database component
ID002P1				Personal information in the customer account files shall be encrypted with access restricted to system managers.
ID002P1	WEB410	4.5.16 My FL511 Profile Page	Encryption	Personal information the customer account files shall be encrypted with access restricted to system managers.
ID003				The Personalization Component shall provide alerts via telephone, email and text messaging.
ID003	WEB409 IVR035	4.5.16 My FL511 Profile Page 5.4.5.4 Alerts/Notification	No. of contacts Alerts/Notification Server	Subscribers can request alerts be transmitted to them using up to 2 email addresses and/or 2 telephone numbers (SMS and phone)

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		Server		
ID003P1				The Personalization Component shall enable subscribers to request that personalized traffic alerts be transmitted to them using up to 2 email addresses and/or up to 2 telephone numbers.
ID003P1	WEB409	4.5.16 My FL511 Profile Page	No. of contacts	Subscribers can request alerts be transmitted to them using up to 2 email addresses and/or 2 telephone numbers (SMS and phone)
ID003P2				Alerts shall be generated according to the segment of roadway selected; time of day and day of week; FDOT defined categories of events and severity of the event.
ID003P2	WEB425	4.5.18 My FL511 Alerts	General	The My FL511 Alerts page provides the means to personalize information alerts
ID003P2	WEB426	4.5.18 My FL511 Alerts	Reception mode	User can personalize their alert information by reception mode (telephone, SMS, email)
ID003P2	WEB427	4.5.18 My FL511 Alerts	Alert Information	Information alerts can be personalized by event type, severity and route.
ID003P2	WEB428	4.5.18 My FL511 Alerts	Alert Timing	The timing of alerts can be personalized by day of the week and time of day.
ID003P3				Users shall be able to define single location/addresses to receive alert messages.
ID003P3	WEB407	4.5.18 My FL511 Alerts	Alert Mode	Subscribers can request alerts be transmitted to them using up to 2 email addresses and/or 2 telephone numbers
ID003P4				Alert messaging capabilities shall include email messages, text alert messages, and website messaging.
ID003P4	WEB414	4.5.18 My FL511 Alerts	Alert mode	Alerts can be provided via telephone, email, text messaging or on the website
ID003P5				Alert messaging shall be available for new events, modified events and terminated events.
ID003P5	WEB425	4.5.18 My FL511 Alerts	General	The My FL511 Alerts page provides the means to personalize information alerts

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ID003P5	WEB426	4.5.18 My FL511 Alerts	Reception mode	User can personalize their alert information by reception mode (telephone, SMS, email)
ID003P5	WEB427	4.5.18 My FL511 Alerts	Alert Information	Information alerts can be personalized by event type, severity and route.
ID003P5	WEB428	4.5.18 My FL511 Alerts	Alert Timing	The timing of alerts can be personalized by day of the week and time of day.
ID003P6				Alert message format shall be user definable.
ID003P6	WEB425	4.5.18 My FL511 Alerts	General	The My FL511 Alerts page provides the means to personalize information alerts
ID003P7				Users shall be able to define frequency, time of day, day of week, roadway location, and event severity for receiving message alerts.
	WEB426	4.5.18 My FL511 Alerts	Reception mode	User can personalize their alert information by reception mode (telephone, SMS, email)
	WEB427	4.5.18 My FL511 Alerts	Alert Information	Information alerts can be personalized by event type, severity and route.
ID003P7	WEB428	4.5.18 My FL511 Alerts	Alert Timing	The timing of alerts can be personalized by day of the week and time of day.
ID003P8				Users shall be able to specify whether to receive all updates, or just blockage and clearance updates to events.
ID003P8	WEB427	4.5.18 My FL511 Alerts	Alert Information	Information alerts can be personalized by event type, severity and route.
ID003P9				Alert message content shall be editable to enable operators with appropriate permission to create alert message content.
ID003P9	WEB440			
ID003P10				A configurable permission setting shall be added to enable operators the ability to edit alert message content.

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ID003P10	WEB441			
ID003P11				The alert messaging function shall structure the content of the message based on account information of each recipient.
ID003P11	WEB442			
ID003P12				The alert message subsystem shall notify operators when event data has changed indicating a new response plan is needed.
ID003P12	WEB443			
ID003P13				The alert message function shall configure content of each message based on recipient account/device restriction (i.e. cell phone with limited message size capabilities approximately 150 characters.)
ID003P13	WEB 429	4.5.18 My FL511 Alerts	Mode Restrictions	Messages will be sized to meet the needs of the mode that will receive the message
ID004P				The Personalization component shall have an operational availability annually of at least 99.90% measured over an operating cycle of 24 hours starting at local midnight.
ID004P	WEB430	4.5.18 My FL511 Alerts	Availability	Alerts will be available 99.9% of the time.
ID005P				The personalization component shall provide travel times on user defined origin/destination pairs that may be composed of more than one road across more than one District.
ID005P	WEB420	4.5.17 My FL511 Routes Page	Add/Modify Routes	The MyFL511 Routes page allows the user to develop, update and delete personal routes for which they can receive traffic and alert information.
ID005P	WEB421	4.5.17 My FL511 Routes Page	Text or Map	The user can select routes using text or graphical (map) means.
ID005P	WEB422	4.5.17 My FL511	Districts	Routes can be developed using segments from multiple districts.

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		Routes Page		
ID006P				The personalization component shall allow a user to specify the language preference for receiving information.
ID006P	WEB400	4.5.14 MY FL511 Welcome/Login Page	Display	The site allows the user to personalize the web site to provide a personalized view with respect to language of the site, map display, routes and information alerts.
ID006P	WEB411	4.5.16 My FL511 Profile Page	Language	The language chosen on the Profile page will become the language that is in effect when the user opens the site.
Database				
Web Site – Every Page				
	WEB40	4.5.2 Every Page		Every Page has a Florida 511 banner at the top to identify the site.
	WEB41	4.5.2 Every Page		The banner has the logo for "Florida 511", pictures and also the name "Florida Department of Transportation" imposed over the pictures.
	WEB42	4.5.2 Every Page		Every Page has hyperlinks to access the main pages in the site: Home, Traffic, Weather, Help, Links (to Other Resources).
	WEB43	4.5.2 Every Page		When the Home hyperlink is selected from any page - the Home Page is displayed.
	WEB44	4.5.2 Every Page		When the Traffic hyperlink is selected from any page - a drop down menu is displayed: Map, Events, Road Signs, Cameras, Weather, Travel Times, My FL511.
	WEB45	4.5.2 Every Page		When one of the drop down menu items from the Traffic hyperlink is selected, the 4.3.4.5.4 Map Page is displayed with the page open for the selected menu item.
	WEB46	4.5.2 Every Page		When the Weather hyperlink is selected from any page - the Weather List Page is displayed.

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	WEB47	4.5.2 Every Page		When the Evacuation hyperlink is selected from any page - information and links to evacuation sites is provided.
	WEB48	4.5.2 Every Page		When the Links hyperlink is selected from any page - the Link Page is displayed.
	WEB49	4.5.2 Every Page		When the Help hyperlink is selected from any page - the Help Page is displayed and the cursor is points to the beginning of the Help section for the page from which the user initiated the request for Help.
	WEB50			
	WEB51	4.5.2 Every Page		Every Page has a toggle to switch languages between English and Spanish.
	WEB52	4.5.2 Every Page		Both the words "English" and "Espanola" are displayed. The current language being used on the site is highlighted.
	WEB53	4.5.2 Every Page		When the language is changed, the page being viewed and all subsequent pages viewed in this visit to the site are in the new language.
	WEB54	4.5.2 Every Page		Every Page has a scrolling banner for floodgate messages.
	WEB55	4.5.2 Every Page		Floodgate messages relate to the geographic level being viewed - regional, county, city, roadway or roadway segment.
	WEB56	4.5.2 Every Page		The bottom banner of 4.3.4.5.2 Every Page of the site provides email links to all pages of the website shown as hyperlinks in the rest of the page (Home, Traffic, Evacuation Info, Weather, Links, Help, Disclaimer, Contact Us)
	WEB57	4.5.2 Every Page		On the bottom of Every Page is the Copyright information.
	WEB58	4.5.2 Every Page		On Every Page there will be a location where the user can view to see their current logon state. If the user is logged in, the banner will say “Welcome” and the users first name with options to “Edit my FL511” or “Logout”. If the user is not logged in, the options will be to “Edit my FL511” or “Login”.
	WEB59	4.5.2 Every Page		On Every Page there will be a link called "Printer Friendly". When clicked, a preview page will appear that shows what would be printed. This will be a clean version of the

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				page with only the important information and images.
	WEB60	4.5.2 Every Page		The page printed does not exceed 600 pixels in width.
	WEB61	4.5.2 Every Page		There will be a "Login" link on Every Page of the site.
	WEB62	4.5.2 Every Page		If the user is logged in to the site, there will be a message shown that says "Welcome Username". If they click on the Username, they will be directed to the Personalization page.
	WEB63	4.5.2 Every Page		if the user is logged in to the site, there will be a "logout" link shown on Every Page.
Web Site – Home Page				
	WEB100	4.5.3 Home Page		The Home Page displays a welcome message, explains the purpose of the site and has links to Every Page in the website.
	WEB101	4.5.3 Home Page		The opening view of the Home Page has links to all of the main pages in the site , a login opportunity, floodgate message and if in use, an override message.
	WEB108	4.5.3 Home Page		The Home Page has graphical hyperlinks to two major resources in the site: Traffic Conditions and Travel Times. The graphic shows what the user will see when they open the page.
	WEB109	4.5.3 Home Page		On the Home Page there is a location for logging into the site to retrieve personalized information.
	WEB110	4.5.3 Home Page		The login area is introduced with a message: "You can receive personalized transportation information from Florida 511 - on the website, by telephone, on your PDA or cell phone."
	WEB111	4.5.3 Home Page		There is a button labeled "New User?. When selected the user is taken to the MY FL511 Profile page where the user can register.
	WEB112	4.5.3 Home Page		There is a data box that says "Username" followed by a databox with "**********" for the password. Beside these databoxes is a button labeled "Login". If the user has entered the appropriate information in the Username and Password data boxes the

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				system takes the user to their personalized site.
	WEB113	4.5.3 Home Page		In the personalization area there is a check box labeled "Remember me" which when selected will cause the system to fill in the username automatically when the user returns to the site.
	WEB114	4.5.3 Home Page		in the personalization area there is a button labeled "Forgot Password". When selected the user will be taken to a page that tells the user that their password will be sent to them in an email.
IVR Component	**SW Module ID (Design Req.)**	**SDD Reference**	**Topic**	**Design Requirement**
ID001V				Callers entering the system shall have access to all information, including detailed District data.
	IVR001	5.7.3 Call Flows	Call Flows	IVR will provide to callers all information that is indicated on the call flows menus
ID002V				The system shall use Natural Language allowing a caller to interact with the system in a more conversational manner, as they would a live operator.
	IVR002	5.7.1.1 Voice Interaction	Voice interaction	
ID003V				The IVR Component shall allow 511 callers from throughout the state to:
	IVR003	5.2.1 511 Translation	Translation	a) Access information using the 511 dialing code; 511 Translation.
	IVR004 IVR036	5.7.1.6.1 Playing Traffic Report with Concatenated Speech 5.7.1.3 Pre-Recorded Audio	Playing Traffic Report with Concatenated Speech Pre-Recorded	b) Retrieve information using spoken commands (with touch-tone backup);

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	IVR005	5.7.1.2 Touch Tone interaction	Audio Touch Tone interaction	
	IVR002	5.7.1.1 Voice interaction	Voice interaction	Voice interaction
	IVR005	5.7.1.2 Touch Tone interaction	Touch Tone interaction	Touch Tone interaction
	IVR006	5.7.1.6 Concatenated Speech	Concatenated Speech	c) Receive that information as pre-recorded concatenated phrases instead of "live recorded" information; and Concatenated Speech
	IVR007	5.7.1.20 Feedback	Feedback	d) Have the option to leave a feedback message about the service
	IVR008	5.7.2 Use Cases	Use Cases	
ID003V1				The IVR Element shall use concatenated speech for a minimum of 90% of the responses.
	IVR006 IVR004	5.7.1.6 Concatenated Speech 5.7.1.6.1 Playing Traffic Report with Concatenated Speech	Concatenated Speech Playing Traffic Report with Concatenated Speech	
ID003V2				Input (data) to the IVR Element shall restrict the use of free-form text, which will be delivered by the system using text-to-speech.

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	IVR022	5.7.1.7 Text-to-Speech	Text-to-Speech	
ID004V				The IVR Component shall provide separate menus and messages in Spanish and in English.
	IVR011	5.7.1.8 Multi-Lingual dialogs	Multi-Lingual dialogs	
ID004V1				The IVR shall provide the same level of detail and accuracy of the information regardless of which language is used.
	IVR011	5.7.1.8 Multi-Lingual dialogs	Multi-Lingual dialogs	
ID005V				The IVR shall have the ability to transfer calls to other agencies based on the transfer information defined by FDOT.
	IVR012	5.7.1.9 Call Transfers	Call Transfers	
ID005V1				The IVR shall use Attended Call Transfers to assure that the caller is not transferred to a busy or unavailable number.
	IVR012	5.7.1.9 Call Transfers	Call Transfers	
ID005V2				To the extent possible, the IVR Element shall transfer the charges associated with the initial call, to the receiving agency, through the phone service provider of both the 511 system and the receiving agency.
ID006V				The IVR Component shall provide adaptive error handling for calls.
	IVR013	5.7.1.10 Adaptive Error Handling	Adaptive Error Handling	
ID006V1				The IVR shall flag caller choices that it misunderstood, and ignore and eliminate them from the list of proper responses.

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	IVR014	5.7.1.16 N-Best Lists	N-Best Lists	
ID006V2				The IVR shall learn from the proper answers to help speed the caller through the interaction, and remember the statistics for later use.
	IVR 029	5.7.1.19 Tuning	Tuning	IVR will store the calls information for tuning purpose. Once the system has collected enough information; LogicTree will tune the system to improve recognition and interaction with the callers.
ID006V3				The IVR Element shall use prompt escalation for handling various levels of recognition and timeout errors.
	IVR013	5.7.1.10 Adaptive Error Handling	Adaptive Error Handling	
ID007V				The IVR component must have an operational availability annually of at least 99.93% measured over an operating cycle of 24 hours starting at local midnight.
ID008V				The IVR shall deliver route segment specific information through the telephone using an automated system so that users do not have to interact with a live operator.
	IVR004 IVR008	5.7.1.6.1 Playing Traffic Report with Concatenated Speech 5.7.2 Use Cases	Playing Traffic Report with Concatenated Speech Use Cases	
ID008V1				The IVR shall provide the option to transfer the caller to a live operator at a centrally located call center to specific District RTMC selected by the caller.
	IVR012	5.7.1.9 Call Transfers	Call Transfers	
ID009V				The Information Dissemination subsystem shall include an interactive voice recognition component to provide assistance to individuals with impairments.
	IVR028	5.7.1.18 TTYD	TTYD Support	

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		Support		
ID009V1				The Information Dissemination subsystem shall include an interactive voice recognition component to provide assistance to individuals with impaired vision.
ID009V2				The Interactive Voice Recognition component shall provide an alternative touch tone response for users in a high ambient noise environment or that have impaired speech.
	IVR005	5.7.1.2 Touch Tone interaction	Touch Tone interaction	
ID010V				The IVR Component shall provide context sensitive help to callers who request it.
	IVR016	5.7.1.11 Context Sensitive Help	Context Sensitive Help	
ID011V				The IVR Component shall use and be able to edit a Text-to-Speech Dictionary, that can be used to modify the pronunciation of words (such as place names, etc.) and save them to the dictionary for future use.
	IVR010	5.3.6 Text-To-Speech Engine	Text-To-Speech Engine	
ID011V1				Text-to-speech engine (software) shall have a tool so the originator of the message can be assured that the wording was being read and pronounced properly.
	IVR010	5.3.6 Text-To-Speech Engine	Text-To-Speech Engine	
ID012V				The IVR shall use an integrated menu, which can be reached by calling 511 anywhere in the state.
	IVR001 IVR003	5.7.3 Call Flows 5.2.1 511 Translation	Call flows 511 Translation	IVR will provide to callers all information that is indicated on the call flows menus
ID013V				The IVR Component shall provide access with authorization code to a backdoor service number that is the toll free number to which the 511 calls are translated to.

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	IVR003	5.2.1 511 Translation	511 Translation	
ID014V				The IVR shall answer all calls.
	IVR027 IVR018	5.4.5.1 InfoGate and Voice Application Servers 5.4.5.2 Telephony Servers	InfoGate and Voice Application Servers Telephony Servers	The IVR will answer all calls to its capacity. After the capacity is fulfilled all the incoming calls will overflow to bursting ports.
ID014V1				The IVR shall be able to add additional capacity within 1 business days or less to meet its response time.
ID014V2				The IVR shall have the ability to handle all calls through bursting capability.
	IVR018	5.4.5.2 Telephony Servers	Telephony Servers	
ID014V3				The IVR shall answer a call within 3 seconds.
	IVR015	5.3.2 SpeechGate	SpeechGate	
ID015V				The IVR Component shall be able to handle 4,000 calls per hour with a peak of 400 simultaneous calls.
	IVR027	5.4.5.1 InfoGate and Voice Application Servers	InfoGate and Voice Application Servers	
ID015V1				The IVR Components shall be able to add port capacity up to handle the required call volume.
ID015V2				The IVR shall have additional ports dedicated to bursting capacity.

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	IVR018	5.4.5.2 Telephony Servers	Telephony Servers	
ID016V				The IVR shall accept the use of DTMF (Dual-Tone Multi-Frequency) or Touch-Tone codes for caller input.
	IVR005	5.7.1.2 Touch Tone interaction	Touch Tone interaction	
ID016V1				If the speech recognition software detects a configurable number of errors by the caller, it shall revert to touch tone response and announce that to the caller.
	IVR005 IVR013	5.7.1.2 Touch Tone interaction 5.7.1.10 Adaptive Error Handling	Touch Tone interaction Adaptive Error Handling	
ID016V2				The IVR shall provide an option key to return to speech recognition by the caller once they are in the DTMF mode.
	IVR005	5.7.1.2 Touch Tone interaction	Touch Tone interaction	
ID017V				The IVR shall offer a conversational approach to 511 callers by asking the user what information they are seeking in general terms to minimize the number of subsequent menus required for the caller to clearly convey their request.
	IVR002 IVR032	5.7.1.1 Voice interaction 5.7.1.12 Shortcuts and the minimization of menu navigation	Voice interaction Shortcuts and the minimization of menu navigation	

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ID017V1				The IVR shall make maximum use of Universal Grammars to interpret a caller's request for traveler information.
	IVR026	5.7.1.4 Universal Grammars	Universal Grammars	
ID018V				The IVR Component shall minimize menu navigation.
	IVR032	5.7.1.12 Shortcuts and the minimization of menu navigation	Shortcuts and the minimization of menu navigation	
ID018V1				Disambiguation of a caller's request shall limit the number of questions asked of the caller to no more than four.
	IVR034	5.7.1.5 Disambiguation	Disambiguation	
ID018V2				The menu structure shall allow for selective "barge-in," where the caller may interrupt the menu voice if they already knew how to ask for the information they wanted. FDOT can specify what parts of the menu the caller can barge in on.
	IVR031	5.7.1.13 Barge-in	Barge-in	
ID018V3				The IVR shall allow users to short-cut to their information without requiring a series of menu selections (questions and answers).
	IVR032	5.7.1.12 Shortcuts and the minimization of menu navigation	Shortcuts and the minimization of menu navigation	
ID019V				The IVR Component shall be able to provide different levels of floodgate messages.
	IVR019	5.6.1.4 Floodgates	Floodgates	
ID019V1				The levels of floodgate messages shall be at the region, county, city, roadway and roadway segment.

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	IVR019	5.6.1.4 Floodgates	Floodgates	
ID019V2				Each Floodgate messages shall be able to be designated to allow barge in or not.
	IVR019 IVR031	5.6.1.4 Floodgates 5.7.1.13 Barge-in	Floodgates Barge-in	
ID019V3				The IVR shall allow calls to be terminated after playing a floodgate message.
	IVR019	5.6.1.4 Floodgates	Floodgates	
ID019V4				The IVR shall be able to use bilingual pre-recorded as well as text-to-speech messages.
	IVR011	5.7.1.8 Multi-Lingual dialogs	Multi-Lingual dialogs	
ID020V				The IVR component shall report traveler information based on FDOT Location codes, SAE codes from table 2 Body Elements of the Non-Nested RDS Table (in ASCII) of SAE J-2540-1 standard and from table 11 Body Elements of the Non-Nested Extended Phrases Table of SAE J-2540-1 standard.
	IVR020	5.6.1.1 Traffic Events	Traffic Events	
ID021V				The IVR shall provide travel times on road segments identified in the 511 call menu.
	IVR021	5.6.1.2 Travel Times	Travel Times	
ID021V1				As a configurable option at the District level, delay times may be provided instead of travel times.
ID022V				Transfers to other telephone systems shall be included that provide additional information to supplement the multimodal information already provided.
	IVR012	5.7.1.9 Call	Call Transfers	

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		Transfers		
ID022V1				Call sites hosted by other agencies to which transfers shall be provided shall include at a minimum:
	IVR012	5.7.1.9 Call Transfers	Call Transfers	Call Transfers
				• Transit agencies
				• Airport services
				• Seaports
				• Tourism agencies
				• Evacuation management agencies
				• Other partners
				• Border state (e.g., Georgia) ATIS services
				• Consumer Information Network Regional Transportation Organization (CIN)
				• Parking
				• Major event venues
ID023V				The IVR component shall recognize callers based on their telephone numbers identified in their use profile.
	IVR023	5.6.4.3 Personalization	Personalization	
ID023V1				The IVR shall offer the caller personalized travel information based on their pre-defined preferences that is part of their profile.
	IVR023	5.6.4.3 Personalization	Personalization	
ID023V2				The IVR shall respond in the language indicated by user profile.
	IVR011	5.7.1.8 Multi-Lingual dialogs	Multi-Lingual dialogs	

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ID024V				The IVR shall capable of adding, modifying, deleting prompt recordings if necessary within 5 business days.
ID025V				IVR call statistics report shall as a minimum include: • Call volume • Average call duration over the reporting period • Number of calls not answered • What hour during the month had the most calls (peak calls) • What day of the month had the most calls (peak calls) • Wait time for each call not answered immediately • Number of errors made in the call menu • Where the errors occurred (what menu selection the error occurred in) • Number and percentage of call transfers • Feedback statistics • Number and percentage of category of information reported
	IVR024	5.3.8 Web Management Console	Web Management Console	
ID026V				IVR call statistics shall be able to be sorted by date/time/ telephone number and composed into reports and made available in print or transmitted electronically.
	IVR024	5.3.8 Web Management Console	Web Management Console	
ID027V				The IVR shall be able to generate reports on an hourly, daily, weekly, monthly, and yearly basis.
	IVR024	5.3.8 Web Management Console	Web Management Console	

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ID028V				The IVR component shall provide travel messages in order of priority reading incidents first; then congestion, and finally construction.
	IVR030	5.7.1.14 Traffic Reports	Traffic Reports	
ID028V1				Within each severity category, events shall be read out according to the direction of travel that has the highest volume for the time of day that information was requested for. For example, provide travel information first for the direction that is the busiest at that point in time.
	IVR033	5.7.1.15 Severity and readout order	Severity and readout order	
ID029V				The IVR shall maintain a log of all calls to the system.
	IVR015 IVR025	5.3.2 SpeechGate 5.3.4 Voice Application	SpeechGate Voice Application	
ID030V				The IVR component shall be developed so that it is flexible and scaleable to allow the addition/modification of various data elements (e.g., adding new roads and/or changing road segments) without the need for major system redesign.
ID031V				The IVR component shall provide TTY service for the hearing impaired.
	IVR028	5.7.1.18 TTYD Support	TTYD Support	
Negotiation Point Requirements	**SW Module ID (Design Req.)**	SDD Reference	Topic	Design Requirement
1			Cell Phone Location Awareness	Location based information being delivered as first choice to caller based on cell phone location system awareness

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2			Transfer to Appropriate Language Operator	When motorist call is directed to call center, system has determined what language caller was using during call. Have call directed to appropriate call taker based on language
	IVR012 IVR011	5.7.1.9 Call Transfers 5.7.1.8 Multilingual Dialogs	Call Transfers Multilingual Dialogs	
3			Alternate Route – Option C (Automated Data Entry Approach)	This approach would automate the selection of the appropriate detour plan so that the SunGuide Operator need not look up or enter any information related to detour plans, but these plans would be identified automatically based on the road closure event information entered by the Operator.
	IVR001	5.7.3 Call Flows	Call flows	IVR will provide to callers all information that is indicated on the call flows menus
4			Traveler Services — Option A: Rest Stop Locations and Services	As part of the 511 system provided to FDOT, the LogicTree-IBI Team will provide locations of wayside / rest stops and types of services provided at each specific stop throughout Florida.
	IVR037	5.6.1.5 Rest Areas	Rest Areas	
5			Emergency Notification Enhanced Services	The IVR will place outbound phone calls or SMS messages to account holders conveying emergency information concerning evacuations, amber alerts and other general emergency information.
	IVR035	5.4.5.4 Alerts/Notification Server	Alerts/Notificatio n Server	

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6			Bandwidth Connectivity for FDOT RTMC	LogicTree will be responsible for procuring a networking solution for the Regional Transportation Management Centers (RTMCs) through the state of Florida.
7			Bursting for Emergency Evacuation	The LogicTree-IBI Team propose to accelerate the delivery of a portion of this bursting capacity for the four 511 IVRs currently in operation and deployed by LogicTree.
8			Floodgate Management Tool (Single user interface: SunGuide	LogicTree will work with SwRI to refine the requirements for the SunGuide floodgate management tool to allow this tool to upload floodgate messages for the new Statewide Florida 511 system.
	IVR019	5.6.1.4 Floodgates	Floodgates	

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Appendix

1 Data Dictionary

1.1 Schema ATIS_RAW_DATA

Contents are populated by FDOT C2C Plug-in Component.

ATIS-Database Schema
July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table	**ATISADMIN**	**ADMINISTRATIVE_AREAS**
Tablespace	**ATIS_SYSTEM**	

	Column	Null?	Type	D	Comments
1	AREA_ID	N	VARCHAR2	10	
2	ADMINLEVEL1_AREA_ID	Y	VARCHAR2	10	
3	ADMINLEVEL2_AREA_ID	Y	VARCHAR2	10	
4	ADMINLEVEL3_AREA_ID	Y	VARCHAR2	10	
5	ADMINLEVEL4_AREA_ID	Y	VARCHAR2	10	
6	ADMINLEVEL5_AREA_ID	Y	VARCHAR2	10	
7	ADMINLEVEL6_AREA_ID	Y	VARCHAR2	10	
8	ADMINLEVEL7_AREA_ID	Y	VARCHAR2	10	
9	ADMINLEVEL	N	NUMBER	1,0	
10	AREA_NAME_LANG1	N	VARCHAR2	256	
11	AREA_NAME_LANG2	Y	VARCHAR2	256	
12	AREA_NAME_LANG3	Y	VARCHAR2	256	
13	AREA_NAME_LANG4	Y	VARCHAR2	256	
14	AREA_NAME_LANG5	Y	VARCHAR2	256	

Primary/Unique Constraint Name	Constraint Column
AREA_PK	1 AREA_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
SYS_C009617	adminlevel BETWEEN 1 AND 7

Index Name	Part	Uniqueness	Indexed Column	Sort
AREA_PK	NO	UNIQUE	1 AREA_ID	

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ATIS-Database Schema

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Schema Owner / Table ATISADMIN LOOKUPS
Tablespace ATIS_SYSTEM

	Column	Null?	Type		D	Comments
1	LOOKUP_ID	N	NUMBER	38,0		
2	LOOKUP_TYPE	N	VARCHAR2	32		
3	LOOKUP_CODE	N	VARCHAR2	32		
4	LOOKUP_RAW	Y	RAW	1		
5	MODIFIED_DATE	N	DATE	7		
6	MODIFIED_BY	N	VARCHAR2	32		
7	EFFECTIVE_DATE	N	DATE	7		
8	CEASED_DATE	N	DATE	7		
9	CEASED_USE	N	NUMBER	1,0		
10	SORT_ORDER	N	NUMBER	38,3		
11	NAME_LANG1	N	VARCHAR2	64		
12	LONG_NAME_LANG1	N	VARCHAR2	256		
13	NAME_LANG2	Y	VARCHAR2	64		
14	LONG_NAME_LANG2	Y	VARCHAR2	256		
15	NAME_LANG3	Y	VARCHAR2	64		
16	LONG_NAME_LANG3	Y	VARCHAR2	256		
17	NAME_LANG4	Y	VARCHAR2	64		
18	LONG_NAME_LANG4	Y	VARCHAR2	256		
19	NAME_LANG5	Y	VARCHAR2	64		
20	LONG_NAME_LANG5	Y	VARCHAR2	256		

Primary/Unique Constraint Name	Constraint Column	
LU_PK	1	LOOKUP_ID
LU_UK	1	LOOKUP_TYPE
	2	LOOKUP_CODE

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
SYS_C009559	ceased_use IN (0, 1)

Index Name	Part	Uniqueness	Indexed Column		Sort
LU_PK	NO	UNIQUE	1	LOOKUP_ID	
LU_UK	NO	UNIQUE	1	LOOKUP_TYPE	
			2	LOOKUP_CODE	

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ATIS-Database Schema

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Schema Owner / Table ATISADMIN METADATA_REFERENCES
Tablespace ATIS_SYSTEM

	Column	Null?	Type	D	Comments
1	MAX_LANG	N	NUMBER	1,0	
2	LANG1_LANG_CODE	N	VARCHAR2	32	
3	LANG2_LANG_CODE	Y	VARCHAR2	32	
4	LANG3_LANG_CODE	Y	VARCHAR2	32	
5	LANG4_LANG_CODE	Y	VARCHAR2	32	
6	LANG5_LANG_CODE	Y	VARCHAR2	32	
7	LANG1_DESC	N	VARCHAR2	256	
8	LANG2_DESC	Y	VARCHAR2	256	
9	LANG3_DESC	Y	VARCHAR2	256	
10	LANG4_DESC	Y	VARCHAR2	256	
11	LANG5_DESC	Y	VARCHAR2	256	
12	MAX_ADMINLEVEL	N	NUMBER	1,0	
13	ADMINLEVEL1_FEATTYPE_CODE	N	VARCHAR2	32	
14	ADMINLEVEL2_FEATTYPE_CODE	Y	VARCHAR2	32	
15	ADMINLEVEL3_FEATTYPE_CODE	Y	VARCHAR2	32	
16	ADMINLEVEL4_FEATTYPE_CODE	Y	VARCHAR2	32	
17	ADMINLEVEL5_FEATTYPE_CODE	Y	VARCHAR2	32	
18	ADMINLEVEL6_FEATTYPE_CODE	Y	VARCHAR2	32	
19	ADMINLEVEL7_FEATTYPE_CODE	Y	VARCHAR2	32	
20	ADMINLEVEL1_DESC	N	VARCHAR2	256	
21	ADMINLEVEL2_DESC	Y	VARCHAR2	256	
22	ADMINLEVEL3_DESC	Y	VARCHAR2	256	
23	ADMINLEVEL4_DESC	Y	VARCHAR2	256	
24	ADMINLEVEL5_DESC	Y	VARCHAR2	256	
25	ADMINLEVEL6_DESC	Y	VARCHAR2	256	
26	ADMINLEVEL7_DESC	Y	VARCHAR2	256	

Primary/Unique Constraint Name	Constraint Column

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
SYS_C009612	max_lang BETWEEN 1 AND 5
SYS_C009613	max_adminlevel BETWEEN 1 AND 7

ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table ATISADMIN METADATA_REFERENCES
Tablespace ATIS_SYSTEM

Index Name	Part	Uniqueness	Indexed Column	Sort

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ATIS-Database Schema

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Schema Owner / Table ATISADMIN ORGANIZATIONS
Tablespace ATIS_DATA

	Column	Null?	Type	D	Comments
1	ORGANIZATION_ID	N	VARCHAR2	32	
2	ORGANIZATION_NAME	Y	VARCHAR2	256	
3	ORGANIZATION_LOCATION	Y	VARCHAR2	10	
4	ORGANIZATION_FUNCTION	Y	VARCHAR2	10	
5	LAST_UPDATE_TIME	Y	TIMESTAMP(6) WITH	13	

Primary/Unique Constraint Name	Constraint Column
ORG_PRIINDEX	1 ORGANIZATION_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
ORG_PRIINDEX	NO	UNIQUE	1 ORGANIZATION_ID	

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ATIS-Database Schema

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Schema Owner / Table ATISADMIN SAE_MESSAGE_CODES
Tablespace ATIS_SYSTEM

	Column	Null?	Type		D	Comments
1	MESSAGE_CODE	N	VARCHAR2	32		
2	MODIFIED_DATE	N	DATE	7		
3	MODIFIED_BY	N	VARCHAR2	32		
4	MESSAGE_TEXT_LANG1	N	VARCHAR2	256		
5	MESSAGE_SPEECH_LANG1	Y	BLOB	4000		
6	MESSAGE_TEXT_LANG2	Y	VARCHAR2	256		
7	MESSAGE_SPEECH_LANG2	Y	BLOB	4000		
8	MESSAGE_TEXT_LANG3	Y	VARCHAR2	256		
9	MESSAGE_SPEECH_LANG3	Y	BLOB	4000		
10	MESSAGE_TEXT_LANG4	Y	VARCHAR2	256		
11	MESSAGE_SPEECH_LANG4	Y	BLOB	4000		
12	MESSAGE_TEXT_LANG5	Y	VARCHAR2	256		
13	MESSAGE_SPEECH_LANG5	Y	BLOB	4000		
14	EVENTTYPE_ID	Y	NUMBER	38,0		

Primary/Unique Constraint Name	Constraint Column
SMC_PK	1 MESSAGE_CODE

Foreign Constraint Name	Table Name	Del?	Constraint Column
SAE_LKUP_FK	SAE_MESSAGE_CODES	CASCADE	1 EVENTTYPE_ID

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
SMC_PK	NO	UNIQUE	1 MESSAGE_CODE	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table ATISADMIN USER_PERMISSIONS
Tablespace ATIS_SYSTEM

	Column	Null?	Type	D	Comments
1	USER_ID	N	NUMBER	38,0	
2	MODIFIED_DATE	N	DATE	7	
3	MODIFIED_BY	N	VARCHAR2	32	
4	PERMISSION_TYPE	N	VARCHAR2	32	

Primary/Unique Constraint Name	Constraint Column
USRPERM_PK	1 USER_ID
	2 PERMISSION_TYPE

Foreign Constraint Name	Table Name	Del?	Constraint Column
USRPERM_USR_FK	USER_PERMISSIONS	CASCADE	1 USER_ID

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
USRPERM_PK	NO	UNIQUE	1 USER_ID	
			2 PERMISSION_TYPE	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table ATISADMIN USERS
Tablespace ATIS_SYSTEM

	Column	Null?	Type		D	Comments
1	USER_ID	N	NUMBER	38,0		
2	MODIFIED_DATE	N	DATE	7		
3	MODIFIED_BY	N	VARCHAR2	32		
4	DISABLED	N	NUMBER	1,0		
5	USER_NAME	N	VARCHAR2	64		
6	EMAIL	N	VARCHAR2	64		
7	ENCRYPTED_PSWD	N	VARCHAR2	32		
8	ORGANIZATION_NAME	N	VARCHAR2	256		

Primary/Unique Constraint Name	Constraint Column	
USR_PK	1	USER_ID
USR_EMAIL_UK	1	EMAIL

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
SYS_C009540	disabled IN (0,1)

Index Name	Part	Uniqueness	Indexed Column		Sort
USR_EMAIL_UK	NO	UNIQUE	1	EMAIL	
USR_PK	NO	UNIQUE	1	USER_ID	

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ATIS-Database Schema

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Schema Owner / Table ATISADMIN WEB_COLOR_LEGENDS
Tablespace ATIS_SYSTEM

	Column	Null?	Type		D	Comments
1	WEB_COLOR_LEGEND_TYPE	N	VARCHAR2	32		
2	LEVELOFSERVICE_ID	Y	NUMBER	38,0		
3	SEVERITY_ID	Y	NUMBER	38,0		
4	EVENTTYPE_ID	Y	NUMBER	38,0		
5	MODIFIED_DATE	N	DATE	7		
6	MODIFIED_BY	N	VARCHAR2	32		
7	WEB_COLOR_ID	N	NUMBER	38,0		
8	LEGEND_DESC_LANG1	N	VARCHAR2	512		
9	LEGEND_DESC_LANG2	Y	VARCHAR2	512		
10	LEGEND_DESC_LANG3	Y	VARCHAR2	512		
11	LEGEND_DESC_LANG4	Y	VARCHAR2	512		
12	LEGEND_DESC_LANG5	Y	VARCHAR2	512		

Primary/Unique Constraint Name	Constraint Column
WEB_COLOR_LEGENDS_UK	1 EVENTTYPE_ID
	2 SEVERITY_ID
	3 LEVELOFSERVICE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
SYS_C009582	web_color_legend_type IN ('LEVELOFSERVICE','SEVERITY','EVENTTYPE')
WBCLRLGND_TYP_CK	(web_color_legend_type ='LEVELOFSERVICE' AND severity_id IS NULL AND levelofservice_id IS NOT NULL) OR (web_color_legend_type<>'SEVERITY' AND severity_id IS NOT NULL AND levelofservice_id IS NULL)

Index Name	Part	Uniqueness	Indexed Column	Sort
WEB_COLOR_LEGENDS_UK	NO	UNIQUE	1 EVENTTYPE_ID	
			2 SEVERITY_ID	
			3 LEVELOFSERVICE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table ATISADMIN WEB_COLORS
Tablespace ATIS_SYSTEM

	Column	Null?	Type		D	Comments
1	WEB_COLOR_ID	N	NUMBER	38,0		
2	MODIFIED_DATE	N	DATE	7		
3	MODIFIED_BY	N	VARCHAR2	32		
4	SCHEME1_RGB	N	CHAR	6		
5	SCHEME2_RGB	N	CHAR	6		
6	SCHEME3_RGB	N	CHAR	6		
7	SCHEME4_RGB	N	CHAR	6		
8	SCHEME5_RGB	N	CHAR	6		

Primary/Unique Constraint Name	Constraint Column
WBCLR_PK	1 WEB_COLOR_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
WBCLR_PK	NO	UNIQUE	1 WEB_COLOR_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table ATISADMIN WP_MESSAGES
Tablespace ATIS_SYSTEM

	Column	Null?	Type	D	Comments
1	WP_MESSAGE_ID	N	NUMBER	38,0	
2	MODIFIED_DATE	N	DATE	7	
3	MODIFIED_BY	N	VARCHAR2	32	
4	MESSAGETYPE_ID	N	NUMBER	38,0	
5	MESSAGE_TEXT_LANG1	N	VARCHAR2	2048	
6	MESSAGE_TEXT_LANG2	Y	VARCHAR2	2048	
7	MESSAGE_TEXT_LANG3	Y	VARCHAR2	2048	
8	MESSAGE_TEXT_LANG4	Y	VARCHAR2	2048	
9	MESSAGE_TEXT_LANG5	Y	VARCHAR2	2048	

Primary/Unique Constraint Name	Constraint Column	
WBNSG_PK	1	WP_MESSAGE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column	
WPMSG_LU_MSGTY_FK	WP_MESSAGES	CASCADE	1	MESSAGETYPE_ID

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column		Sort
WBNSG_PK	NO	UNIQUE	1	WP_MESSAGE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table ATISADMIN WP_RESOURCES
Tablespace ATIS_SYSTEM

	Column	Null?	Type		D	Comments
1	RESOURCE_ID	N	NUMBER	38,0		
2	RESOURCE_NAME	N	VARCHAR2	256		
3	MODIFIED_DATE	N	DATE	7		
4	MODIFIED_BY	N	VARCHAR2	32		
5	EFFECTIVE_DATE	N	DATE	7		
6	CEASED_DATE	N	DATE	7		
7	CEASED_USE	N	NUMBER	1,0		
8	SORT_ORDER	N	NUMBER	38,3		
9	ORGANIZATION_NAME	Y	VARCHAR2	256		
10	CONTACT_NAME	Y	VARCHAR2	256		
11	CONTACT_TITLE	Y	VARCHAR2	256		
12	PHONE1	Y	VARCHAR2	32		
13	PHONE2	Y	VARCHAR2	32		
14	EMAIL1	Y	VARCHAR2	64		
15	EMAIL2	Y	VARCHAR2	64		
16	ADDRESS	Y	VARCHAR2	256		
17	ITEMOF_RESOURCE_ID	Y	NUMBER	38,0		
18	IS_URL	N	NUMBER	1,0		
19	RESOURCE_LABEL_LANG1	N	VARCHAR2	512		
20	RESOURCE_URL_LANG1	Y	VARCHAR2	512		
21	RESOURCE_TITLE_LANG1	Y	VARCHAR2	512		
22	RESOURCE_DESC_LANG1	Y	VARCHAR2	512		
23	RESOURCE_LABEL_LANG2	Y	VARCHAR2	512		
24	RESOURCE_URL_LANG2	Y	VARCHAR2	512		
25	RESOURCE_TITLE_LANG2	Y	VARCHAR2	512		
26	RESOURCE_DESC_LANG2	Y	VARCHAR2	512		
27	RESOURCE_LABEL_LANG3	Y	VARCHAR2	512		
28	RESOURCE_URL_LANG3	Y	VARCHAR2	512		
29	RESOURCE_TITLE_LANG3	Y	VARCHAR2	512		
30	RESOURCE_DESC_LANG3	Y	VARCHAR2	512		
31	RESOURCE_LABEL_LANG4	Y	VARCHAR2	512		
32	RESOURCE_URL_LANG4	Y	VARCHAR2	512		
33	RESOURCE_TITLE_LANG4	Y	VARCHAR2	512		
34	RESOURCE_DESC_LANG4	Y	VARCHAR2	512		
35	RESOURCE_LABEL_LANG5	Y	VARCHAR2	512		
36	RESOURCE_URL_LANG5	Y	VARCHAR2	512		
37	RESOURCE_TITLE_LANG5	Y	VARCHAR2	512		
38	RESOURCE_DESC_LANG5	Y	VARCHAR2	512		

Primary/Unique Constraint Name	Constraint Column
WPRSRC_PK	1 RESOURCE_ID

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Schema Owner / Table ATISADMIN WP_RESOURCES
Tablespace ATIS_SYSTEM

Foreign Constraint Name	Table Name	Del?	Constraint Column
WPRSRC_SELF_FK	WP_RESOURCES	CASCADE	1 ITEMOF_RESOURCE_ID

Check Constraint Name	Condition
SYS_C009595	ceased_use IN (0, 1)
SYS_C009596	is_url IN (0,1)
WPRSRC_CK	is_url=0 OR (is_url=1 AND resource_url_lang1 IS NOT NULL)

Index Name	Part	Uniqueness	Indexed Column	Sort
WPRSRC_PK	NO	UNIQUE	1 RESOURCE_ID	

ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table ATISADMIN WP_STATS_PAGE_VIEWS
Tablespace ATIS_SYSTEM

	Column	Null?	Type	D	Comments
1	IP	N	VARCHAR2	32	
2	PAGE	N	VARCHAR2	256	
3	BROWSER	N	VARCHAR2	256	
4	MOMENT	N	DATE	7	
5	DAY	N	DATE	7	

Primary/Unique Constraint Name	Constraint Column

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
IND_PAGEV_DAY	NO		1 DAY	
			2 PAGE	

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ATIS-Database Schema

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Schema Owner / Table ATISADMIN WP_STATS_UNIQUE_VISITORS
Tablespace ATIS_SYSTEM

	Column	Null?	Type	D	Comments
1	IP	N	VARCHAR2	32	
2	FIRST_PAGE	N	VARCHAR2	256	
3	BROWSER	N	VARCHAR2	256	
4	START_TIME	N	DATE	7	
5	DAY	N	DATE	7	

Primary/Unique Constraint Name	Constraint Column

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
IND_UVISITORS_DAY	NO		1 DAY	

ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table MY511 PROFILE_SEGMENTS
Tablespace SUBSCRIPTION_DATA

	Column	Null?	Type	D	Comments
1	PROFILE_ID	N	NUMBER	38,0	
2	SEGMENT_ID	N	NUMBER	38,0	

Primary/Unique Constraint Name	Constraint Column
PRFLSG_PK	1 PROFILE_ID 2 SEGMENT_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column
PRFLSG_PRFL_FK	PROFILE_SEGMENTS	CASCADE	1 PROFILE_ID
PRFLSG_SG_FK	PROFILE_SEGMENTS	CASCADE	1 SEGMENT_ID

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
PRFLSG_PK	NO	UNIQUE	1 PROFILE_ID 2 SEGMENT_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table MY511 PROFILES
Tablespace SUBSCRIPTION_DATA

	Column	Null?	Type		D	Comments
1	PROFILE_ID	N	NUMBER	38,0		
2	SUBSCRIBER_ID	N	NUMBER	38,0		
3	SYS_FUTUREUSE1	Y	NUMBER	1,0		
4	SYS_FUTUREUSE2	Y	NUMBER	1,0		
5	SYS_FUTUREUSE3	Y	NUMBER	1,0		
6	SYS_FUTUREUSE4	Y	NUMBER	1,0		
7	SYS_FUTUREUSE5	Y	NUMBER	1,0		
8	MODIFIED_DATE	N	DATE	7		
9	MODIFIED_BY	N	VARCHAR2	32		
10	PROFILE_NAME	N	VARCHAR2	256		
11	PROFILE_DESC	Y	VARCHAR2	512		
12	ALERT_DOW_RAW	Y	RAW	1		
13	ALERT_BEGIN_TOD_RAW	Y	RAW	1		
14	ALERT_END_TOD_RAW	Y	RAW	1		
15	ALERT_EVENTTYPE_RAW	Y	RAW	1		
16	ALERT_SEVERITY_RAW	Y	RAW	1		
17	LAST_TOD_ALERT_SENT_DATE	Y	DATE	7		
18	LAST_TRIGGER_ALERT_SENT_DATE	Y	DATE	7		
19	LAST_TRIGGER_ALERT_CENTER_ID	Y	VARCHAR2	32		
20	LAST_TRIGGER_ALERT_EVENT_ID	Y	VARCHAR2	32		
21	ALERT_BY_EMAIL1	N	NUMBER	1,0		
22	ALERT_BY_EMAIL2	N	NUMBER	1,0		
23	ALERT_BY_SMS1	N	NUMBER	1,0		
24	ALERT_BY_SMS2	N	NUMBER	1,0		
25	ALERT_BY_CALLBACK1	N	NUMBER	1,0		
26	ALERT_BY_CALLBACK2	N	NUMBER	1,0		

Primary/Unique Constraint Name	Constraint Column
PRFL_PK	1 PROFILE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column
PRFL_SBSCRBR_FK	PROFILES	CASCADE	1 SUBSCRIBER_ID

Check Constraint Name	Condition

ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table MY511 PROFILES
Tablespace SUBSCRIPTION_DATA

Index Name	Part	Uniqueness	Indexed Column	Sort
PRFL_PK	NO	UNIQUE	1 PROFILE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table MY511 SEGMENT_LOCATIONS
Tablespace SUBSCRIPTION_DATA

	Column	Null?	Type	D	Comments
1	SEGMENT_ID	N	NUMBER	38,0	
2	NETWORK_ID	N	VARCHAR2	32	
3	LOCATION_ID	N	VARCHAR2	32	

Primary/Unique Constraint Name	Constraint Column
SGLC_PK	1 SEGMENT_ID
	2 NETWORK_ID
	3 LOCATION_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column
SGLC_SG_FK	SEGMENT_LOCATIONS	CASCADE	1 SEGMENT_ID

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
SGLC_PK	NO	UNIQUE	1 SEGMENT_ID	
			2 NETWORK_ID	
			3 LOCATION_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table MY511 SEGMENT_ROUTES
Tablespace SUBSCRIPTION_DATA

	Column	Null?	Type	D	Comments
1	SEGMENT_ID	N	NUMBER	38,0	
2	NETWORK_ID	N	VARCHAR2	32	
3	ROUTE_ID	N	VARCHAR2	32	

Primary/Unique Constraint Name	Constraint Column
SGRT_PK	1 SEGMENT_ID
	2 NETWORK_ID
	3 ROUTE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column
SGRT_SG_FK	SEGMENT_ROUTES	CASCADE	1 SEGMENT_ID

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
SGRT_PK	NO	UNIQUE	1 SEGMENT_ID	
			2 NETWORK_ID	
			3 ROUTE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table MY511 SEGMENTS
Tablespace SUBSCRIPTION_DATA

	Column	Null?	Type		D	Comments
1	SEGMENT_ID	N	NUMBER	38,0		
2	SYS_ROUTE_CNT	N	NUMBER	38,0		
3	SYS_LOCATION_CNT	N	NUMBER	38,0		
4	SYS_INUSE	N	NUMBER	1,0		
5	SYS_LEVELOFSERVICE_ID	Y	NUMBER	38,0		
6	SYS_LEVELOFSERVICE_CODE	Y	VARCHAR2	32		
7	SYS_LEVELOFSERVICE_RAW	Y	RAW	1		
8	SYS_FUTUREUSE1	Y	NUMBER	1,0		
9	SYS_FUTUREUSE2	Y	NUMBER	1,0		
10	SYS_FUTUREUSE3	Y	NUMBER	1,0		
11	SYS_FUTUREUSE4	Y	NUMBER	1,0		
12	SYS_FUTUREUSE5	Y	NUMBER	1,0		
13	MODIFIED_DATE	N	DATE	7		
14	MODIFIED_BY	N	VARCHAR2	32		
15	SEGMENT_NAME	N	VARCHAR2	256		
16	SEGMENT_LENGTH	Y	NUMBER	22		
17	LEVEL_OF_SERVICE	Y	VARCHAR2	32		
18	DELAY	Y	NUMBER	38,0		
19	ALTERNATE_ROUTE_DELAY	Y	NUMBER	38,0		
20	HEADWAY_AVERAGE	Y	NUMBER	22		
21	TRAVEL_TIME	Y	NUMBER	38,0		
22	TRAVEL_TIME_INCREASE	Y	NUMBER	38,0		
23	VOLUME_AVERAGE	Y	NUMBER	22		
24	SPEED_AVERAGE	Y	NUMBER	22		
25	NETWORK_ID	N	VARCHAR2	32		
26	ROUTE_DESIGNATOR	N	VARCHAR2	64		
27	LINK_DIRECTION	N	VARCHAR2	32		
28	BEGIN_LOCATION_ID	N	VARCHAR2	32		
29	END_LOCATION_ID	N	VARCHAR2	32		

Primary/Unique Constraint Name	Constraint Column
SG_PK	1 SEGMENT_ID
SG_UK	1 NETWORK_ID
	2 ROUTE_DESIGNATOR
	3 LINK_DIRECTION
	4 BEGIN_LOCATION_ID
	5 END_LOCATION_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table MY511 SEGMENTS
Tablespace SUBSCRIPTION_DATA

Check Constraint Name	Condition
SYS_C009803	sys_inuse IN (0,1)

Index Name	Part	Uniqueness	Indexed Column		Sort
SG_PK	NO	UNIQUE	1	SEGMENT_ID	
SG_UK	NO	UNIQUE	1	NETWORK_ID	
			2	ROUTE_DESIGNATOR	
			3	LINK_DIRECTION	
			4	BEGIN_LOCATION_ID	
			5	END_LOCATION_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table MY511 SUBSCRIBERS
Tablespace SUBSCRIPTION_DATA

	Column	Null?	Type	D	Comments
1	SUBSCRIBER_ID	N	NUMBER	38,0	
2	USER_NAME	N	VARCHAR2	64	
3	MODIFIED_DATE	N	DATE	7	
4	MODIFIED_BY	N	VARCHAR2	32	
5	ENCRYPTED_PSWD	N	VARCHAR2	32	
6	QUESTIONTYPE_ID	N	NUMBER	38,0	
7	ENCRYPTED_ANSWER	N	VARCHAR2	256	
8	PREFERRED_LANG_ID	N	NUMBER	38,0	
9	PHONE1	N	VARCHAR2	32	
10	EMAIL1	N	VARCHAR2	64	
11	PHONE2	Y	VARCHAR2	32	
12	EMAIL2	Y	VARCHAR2	64	

Primary/Unique Constraint Name	Constraint Column
SBSCRBR_PK	1 SUBSCRIBER_ID
SBSCRBR_USRNM_UK	1 USER_NAME

Foreign Constraint Name	Table Name	Del?	Constraint Column
SBSCRBR_LU_LNG_FK		SET NULL	
SBSCRBR_LU_QUSTNTYP_FK		SET NULL	

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
SBSCRBR_PK	NO	UNIQUE	1 SUBSCRIBER_ID	
SBSCRBR_USRNM_UK	NO	UNIQUE	1 USER_NAME	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI ATIS_TABLES
Tablespace ATIS_DATA

Description of tables in ATIS schema. Includes: timestamp of last modification.

	Column	Null?	Type		D	Comments
1	TABLE_NAME	N	VARCHAR2	32		Table name.
2	LAST_DML_TIME	N	TIMESTAMP(6) WITH	13		Last time table content was modified.

Primary/Unique Constraint Name	Constraint Column	
TBL_PK	1	TABLE_NAME

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column		Sort
TBL_PK	NO	UNIQUE	1	TABLE_NAME	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI CCTV_INVENTORIES
Tablespace INVENTORY_DATA

	Column	Null?	Type		Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13	Timestamp of when record is written to database.
2	SYS_AREA_ID	Y	VARCHAR2	32	
3	SYS_FUTUREUSE1	Y	NUMBER	1,0	
4	SYS_FUTUREUSE2	Y	NUMBER	1,0	
5	SYS_FUTUREUSE3	Y	NUMBER	1,0	
6	SYS_FUTUREUSE4	Y	NUMBER	1,0	
7	SYS_FUTUREUSE5	Y	NUMBER	1,0	
8	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13	
9	ORGANIZATION_ID	Y	VARCHAR2	32	Organization identifier.
10	ORGANIZATION_NAME	Y	VARCHAR2	256	Organization name.
11	ORGANIZATION_LOCATION	Y	VARCHAR2	10	Organizational descriptive location/jurisdication.
12	ORGANIZATION_FUNCTION	Y	VARCHAR2	10	
13	ORGANIZATION_CENTER_ID	N	VARCHAR2	32	
14	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256	
15	DEVICE_ID	N	VARCHAR2	32	
16	DEVICE_LOCATION_LATITUDE	N	NUMBER	9,0	Latitude.
17	DEVICE_LOCATION_LONGITUDE	N	NUMBER	10,0	Longitude.
18	DEVICE_LOCATION_HORIZDATUM	Y	VARCHAR2	32	
19	DEVICE_NAME	N	VARCHAR2	128	
20	DEVICE_DESCRIPTION	Y	VARCHAR2	128	
21	DEVICE_CONTROL_TYPE	Y	VARCHAR2	32	
22	NETWORK_ID	Y	VARCHAR2	32	
23	NODE_ID	Y	VARCHAR2	32	Node identifier.
24	NODE_NAME	Y	VARCHAR2	256	
25	LINK_ID	Y	VARCHAR2	32	Link identifier.
26	LINK_DIRECTION	Y	VARCHAR2	32	Roadway direction of travel.
27	LINEAR_REFERENCE	Y	VARCHAR2	4000	
28	LINEAR_REFERENCE_VERSION	Y	NUMBER	3,0	
29	ROUTE_DESIGNATOR	N	VARCHAR2	64	Roadway identifier.
30	DEVICE_URL	Y	VARCHAR2	128	
31	LAST_UPDATE_TIME	N	TIMESTAMP(6) WITH	13	Source timestamp of record update.
32	CCTV_TITLING_TEXT	Y	VARCHAR2	64	
33	CCTV_CAMERA_TYPE	Y	VARCHAR2	32	
34	CCTV_CAMERA_PAN_LEFT_LIMIT	Y	NUMBER	22	
35	CCTV_CAMERA_PAN_RIGHT_LIMIT	Y	NUMBER	22	
36	CCTV_CAMERA_TILT_UP_LIMIT	Y	NUMBER	22	
37	CCTV_CAMERA_TILT_DOWN_LIMIT	Y	NUMBER	22	
38	CCTV_CAMERA_ZOOM_LIMIT	Y	NUMBER	22	
39	CCTV_CAMERA_FOCUS_LIMIT	Y	NUMBER	22	
40	CCTV_CAMERA_IRIS_LIMIT	Y	NUMBER	22	

Primary/Unique Constraint Name	Constraint Column
CCI_PK	1 ORGANIZATION_CENTER_ID
	2 DEVICE_ID

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI CCTV_INVENTORIES
Tablespace INVENTORY_DATA

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
AVCON_1193693223_LINK__006	LINK_DIRECTION IN ('n', 'ne', 'e', 'se', 's', 'sw', 'w', 'nw', 'not directional', 'positive direction', 'negative direction', 'both directions')
AVCON_1193693223_LINK__007	cctv_camera_type IN ('bw','color')
AVCON_1193693223_LINK__008	device_control_type IN ('status only','command only','status and command','not specified')

Index Name	Part	Uniqueness	Indexed Column		Sort
CCI_PK	NO	UNIQUE	1	ORGANIZATION_CENTER_ID	
			2	DEVICE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI CCTV_STATUSES
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		Timestamp of when record is written to database.
2	SYS_FUTUREUSE1	Y	NUMBER	1,0		
3	SYS_FUTUREUSE2	Y	NUMBER	1,0		
4	SYS_FUTUREUSE3	Y	NUMBER	1,0		
5	SYS_FUTUREUSE4	Y	NUMBER	1,0		
6	SYS_FUTUREUSE5	Y	NUMBER	1,0		
7	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
8	ORGANIZATION_ID	Y	VARCHAR2	32		Organization identifier.
9	ORGANIZATION_NAME	Y	VARCHAR2	256		Organization name.
10	ORGANIZATION_LOCATION	Y	VARCHAR2	10		Organizational descriptive location/jurisdication.
11	ORGANIZATION_FUNCTION	Y	VARCHAR2	10		
12	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
13	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256		
14	DEVICE_ID	N	VARCHAR2	32		
15	DEVICE_STATUS	N	VARCHAR2	32		
16	CENTER_ID	Y	VARCHAR2	32		
17	DEVICE_COMM_STATUS	Y	VARCHAR2	32		
18	OPERATOR_ID	Y	VARCHAR2	32		
19	EVENT_ID	Y	VARCHAR2	32		
20	RESPONSE_PLAN_ID	Y	VARCHAR2	32		
21	LAST_COMM_TIME	N	TIMESTAMP(6) WITH	13		
22	CCTV_ERROR	Y	VARCHAR2	32		
23	CCTV_POSITION_PRESET	Y	NUMBER	22		
24	CCTV_POSITION_PAN	Y	NUMBER	22		
25	CCTV_POSITION_TILT	Y	NUMBER	22		
26	CCTV_POSITION_ZOOM_LENS	Y	NUMBER	22		
27	CCTV_POSITION_IRIS_LENS	Y	NUMBER	22		
28	CCTV_POSITION_FOCUS_LENS	Y	NUMBER	22		
29	BLOCKED_IMAGE	Y	NUMBER	1,0		

Primary/Unique Constraint Name	Constraint Column
CCS_PK	1 ORGANIZATION_CENTER_ID
	2 DEVICE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI CCTV_STATUSES
Tablespace ATIS_DATA

Check Constraint Name	Condition
CCS_ERR_CH	CCTV_ERROR IN ('communications error','power failure','device error','controller error')
CCS_STTS_CH	DEVICE_STATUS IN ('on', 'off', 'in service', 'out of service', 'unavailable', 'unknown')

Index Name	Part	Uniqueness	Indexed Column		Sort
CCS_PK	NO	UNIQUE	1	ORGANIZATION_CENTER_ID	
			2	DEVICE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI DMS_INVENTORIES
Tablespace INVENTORY_DATA

	Column	Null?	Type		Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13	Timestamp of when record is written to database.
2	SYS_AREA_ID	Y	VARCHAR2	32	
3	SYS_FUTUREUSE1	Y	NUMBER	1,0	
4	SYS_FUTUREUSE2	Y	NUMBER	1,0	
5	SYS_FUTUREUSE3	Y	NUMBER	1,0	
6	SYS_FUTUREUSE4	Y	NUMBER	1,0	
7	SYS_FUTUREUSE5	Y	NUMBER	1,0	
8	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13	
9	ORGANIZATION_ID	Y	VARCHAR2	32	Organization identifier.
10	ORGANIZATION_NAME	Y	VARCHAR2	256	Organization name.
11	ORGANIZATION_LOCATION	Y	VARCHAR2	10	Organizational descriptive location/jurisdication.
12	ORGANIZATION_FUNCTION	Y	VARCHAR2	10	
13	ORGANIZATION_CENTER_ID	N	VARCHAR2	32	
14	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256	
15	DEVICE_ID	N	VARCHAR2	32	
16	DEVICE_LOCATION_LATITUDE	N	NUMBER	9,0	Latitude.
17	DEVICE_LOCATION_LONGITUDE	N	NUMBER	10,0	Longitude.
18	DEVICE_LOCATION_HORIZDATUM	Y	VARCHAR2	32	
19	DEVICE_NAME	N	VARCHAR2	128	
20	DEVICE_DESCRIPTION	Y	VARCHAR2	128	
21	DEVICE_CONTROL_TYPE	Y	VARCHAR2	32	
22	NETWORK_ID	Y	VARCHAR2	32	
23	NODE_ID	Y	VARCHAR2	32	
24	NODE_NAME	Y	VARCHAR2	256	
25	LINK_ID	Y	VARCHAR2	32	Link identifier.
26	LINK_DIRECTION	Y	VARCHAR2	32	Roadway direction of travel.
27	LINEAR_REFERENCE	Y	VARCHAR2	4000	
28	LINEAR_REFERENCE_VERSION	Y	NUMBER	3,0	
29	ROUTE_DESIGNATOR	N	VARCHAR2	64	Roadway identifier.
30	DEVICE_URL	Y	VARCHAR2	128	
31	LAST_UPDATE_TIME	N	TIMESTAMP(6) WITH	13	Source timestamp of record update.
32	DMS_SIGN_TYPE	N	VARCHAR2	32	
33	SIGN_TECHNOLOGY	Y	NUMBER	22	
34	SIGN_HEIGHT_PIXELS	Y	NUMBER	22	
35	SIGN_WIDTH_PIXELS	Y	NUMBER	22	
36	SIGN_HEIGHT	Y	NUMBER	22	
37	SIGN_WIDTH	Y	NUMBER	22	
38	CHAR_HEIGHT_PIXELS	Y	NUMBER	22	
39	CHAR_WIDTH_PIXELS	Y	NUMBER	22	
40	DMS_BEACON_TYPE	Y	VARCHAR2	32	
41	DMS_VERTICAL_BORDER	Y	NUMBER	22	
42	DMS_HORIZONTAL_BORDER	Y	NUMBER	22	
43	DMS_VERTICAL_PIXEL_PITCH	Y	NUMBER	22	
44	DMS_HORIZONTAL_PIXEL_PITCH	Y	NUMBER	22	
45	DMS_MAX_PAGES	Y	NUMBER	22	
46	DMS_MAX_MESSAGE_LENGTH	Y	NUMBER	22	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI DMS_INVENTORIES
Tablespace INVENTORY_DATA

	Column	Null?	Type	D	Comments
47	DMS_COLOR_SCHEME	Y	NUMBER	22	
48	DMS_MULTI_TAG_SUPPORT	Y	NUMBER	22	

Primary/Unique Constraint Name	Constraint Column
DMI_PK	1 ORGANIZATION_CENTER_ID
	2 DEVICE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
AVCON_1193693223_DMS_B_000	DMS_BEACON_TYPE IN ('other', 'none', 'oneBeacon', 'twoBeaconSyncFlash', 'twoBeaconsOppFlash', 'fourBeaconSyncFlash', 'fourBeaconAltRowFlash' , 'fourBeaconAltColumnFlash', 'fourBeaconAltDiagonalFlash', 'fourBeaconNoCyncFlash', 'oneBeaconStrobe', 'twoBeaconStrobe', 'fourBeaconStrobe')
AVCON_1193693223_DMS_I_001	device_control_type IN ('status only','command only','status and command','not specified')
AVCON_1193693223_DMS_I_002	dms_sign_type IN ('variable message sign VMS','changeable message sign CMS','blank out sign BOS','portable VMS','other')
AVCON_1193693223_DMS_S_000	DMS_SIGN_TYPE IN ('variable message sign VMS', 'changeable message sign CMS', 'blank out sign GOS', 'portable VMS', 'other')
AVCON_1193693223_LINK__000	LINK_DIRECTION IN ('n', 'ne', 'e', 'se', 's', 'sw', 'w', 'nw', 'not directional', 'positive direction', 'negative direction', 'both directions')

Index Name	Part	Uniqueness	Indexed Column	Sort
DMI_PK	NO	UNIQUE	1 ORGANIZATION_CENTER_ID	
			2 DEVICE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI DMS_STATUSES
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		Timestamp of when record is written to database.
2	SYS_CURRENT_PHASE1_MESSAGE	Y	VARCHAR2	256		
3	SYS_CURRENT_PHASE2_MESSAGE	Y	VARCHAR2	256		
4	SYS_FUTUREUSE1	Y	NUMBER	1,0		
5	SYS_FUTUREUSE2	Y	NUMBER	1,0		
6	SYS_FUTUREUSE3	Y	NUMBER	1,0		
7	SYS_FUTUREUSE4	Y	NUMBER	1,0		
8	SYS_FUTUREUSE5	Y	NUMBER	1,0		
9	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
10	ORGANIZATION_ID	Y	VARCHAR2	32		Organization identifier.
11	ORGANIZATION_NAME	Y	VARCHAR2	256		Organization name.
12	ORGANIZATION_LOCATION	Y	VARCHAR2	10		Organizational descriptive location/jurisdication.
13	ORGANIZATION_FUNCTION	Y	VARCHAR2	10		
14	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
15	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256		
16	DEVICE_ID	N	VARCHAR2	32		
17	DEVICE_STATUS	N	VARCHAR2	32		
18	CENTER_ID	Y	VARCHAR2	32		
19	DEVICE_COMM_STATUS	N	VARCHAR2	32		
20	OPERATOR_ID	Y	VARCHAR2	32		
21	EVENT_ID	Y	VARCHAR2	32		
22	RESPONSE_PLAN_ID	Y	VARCHAR2	32		
23	LAST_COMM_TIME	N	TIMESTAMP(6) WITH	13		
24	CURRENT_MESSAGE	N	VARCHAR2	4000		
25	MESSAGE_NUMBER	Y	NUMBER	22		
26	MESSAGE_TIME_REMAINING	Y	NUMBER	22		
27	MESSAGE_SOURCE_MODE	Y	NUMBER	22		

Primary/Unique Constraint Name	Constraint Column
DMS_PK	1 ORGANIZATION_CENTER_ID
	2 DEVICE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI DMS_STATUSES
Tablespace ATIS_DATA

Check Constraint Name	Condition
AVCON_1193693223_DEVIC_002	DEVICE_STATUS IN ('on', 'off', 'in service', 'out of service', 'unavailable', 'unknown')
AVCON_1193693223_DEVIC_003	device_comm_status IN ('operational','offline','failed','unknown')

Index Name	Part	Uniqueness	Indexed Column		Sort
DMS_PK	NO	UNIQUE	1	ORGANIZATION_CENTER_ID	
			2	DEVICE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI EVENT_ELEMENT_DESCRIPTIONS
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
2	SYS_FUTUREUSE1	Y	NUMBER	1,0		
3	SYS_FUTUREUSE2	Y	NUMBER	1,0		
4	SYS_FUTUREUSE3	Y	NUMBER	1,0		
5	SYS_FUTUREUSE4	Y	NUMBER	1,0		
6	SYS_FUTUREUSE5	Y	NUMBER	1,0		
7	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
8	ORGANIZATION_ID	Y	VARCHAR2	32		
9	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
10	EVENT_ID	N	VARCHAR2	32		
11	EVENT_ELEMENT_IDX	N	NUMBER	3,0		
12	EVENT_ELEMENT_DESCRIPTION_IDX	N	NUMBER	3,0		
13	EVENT_DESCRIPTION_TYPE	N	VARCHAR2	32		
14	EVENT_TYPE	Y	VARCHAR2	32		
15	EVENT_SUBTYPE	Y	VARCHAR2	32		
16	ADVICE_TYPE	Y	VARCHAR2	32		
17	ADVICE	Y	VARCHAR2	256		
18	QUALIFIER_TYPE	Y	VARCHAR2	32		
19	QUALIFIER	Y	VARCHAR2	256		
20	QUANTITY_TYPE	Y	VARCHAR2	32		
21	QUANTITY_SUBTYPE	Y	VARCHAR2	32		
22	QUANTITY	Y	VARCHAR2	256		
23	LANDMARK_TYPE	Y	VARCHAR2	10		
24	LANDMARK_NAME	Y	VARCHAR2	256		
25	POINT_NAME	Y	VARCHAR2	256		
26	LOCATION_RANK	Y	VARCHAR2	10		
27	LATITUDE	Y	NUMBER	9,0		
28	LONGITUDE	Y	NUMBER	10,0		
29	HORIZDATUM	Y	VARCHAR2	32		
30	UPWARD_AREA_ID	Y	VARCHAR2	32		
31	UPWARD_AREA_NAME	Y	VARCHAR2	256		
32	DESCRIPTION	Y	VARCHAR2	256		
33	LANGUAGE	Y	VARCHAR2	32		
34	REPORT_MEDIUM	Y	VARCHAR2	32		
35	QUALIFIER_TIME	Y	TIMESTAMP(6) WITH	13		
36	MESSAGE_CODE	Y	VARCHAR2	32		
37	MESSAGE_QUALIFIER	Y	VARCHAR2	256		

Primary/Unique Constraint Name	Constraint Column
EVELD_PK	1 ORGANIZATION_CENTER_ID
	2 EVENT_ID
	3 EVENT_ELEMENT_IDX

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI EVENT_ELEMENT_DESCRIPTIONS
Tablespace ATIS_DATA

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
EVELD_PK	NO	UNIQUE	1 ORGANIZATION_CENTER_ID	
			2 EVENT_ID	
			3 EVENT_ELEMENT_IDX	

ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI EVENT_PROJECT_REFERENCES
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
2	SYS_FUTUREUSE1	Y	NUMBER	1,0		
3	SYS_FUTUREUSE2	Y	NUMBER	1,0		
4	SYS_FUTUREUSE3	Y	NUMBER	1,0		
5	SYS_FUTUREUSE4	Y	NUMBER	1,0		
6	SYS_FUTUREUSE5	Y	NUMBER	1,0		
7	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
8	ORGANIZATION_ID	Y	VARCHAR2	32		
9	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
10	EVENT_ID	N	VARCHAR2	32		
11	PROJECT_REFERENCE_TYPE	N	VARCHAR2	32		
12	RESOURCE_ID	Y	VARCHAR2	32		
13	DESCRIPTION_NOTES	Y	VARCHAR2	2048		

Primary/Unique Constraint Name	Constraint Column

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
EVPR	project_reference_type IN ('project-reference', 'permit-reference', 'project-description')

Index Name	Part	Uniqueness	Indexed Column	Sort

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI EVENTS
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		Timestamp of when record is written to database.
2	SYS_AREA_ID	Y	VARCHAR2	32		
3	SYS_DOW_ID	Y	NUMBER	38,0		
4	SYS_DOW_RAW	Y	RAW	1		
5	SYS_TOD_ID	Y	NUMBER	38,0		
6	SYS_TOD_RAW	Y	RAW	1		
7	SYS_EVENTTYPE_ID	Y	NUMBER	38,0		
8	SYS_EVENTTYPE_CODE	Y	VARCHAR2	32		
9	SYS_EVENTTYPE_RAW	Y	RAW	1		
10	SYS_SEVERITY_ID	Y	NUMBER	38,0		
11	SYS_SEVERITY_CODE	Y	VARCHAR2	32		
12	SYS_SEVERITY_RAW	Y	RAW	1		
13	SYS_IS_FULLCLOSURE	Y	NUMBER	1,0		
14	SYS_EVENT_DESC_LANG1	Y	VARCHAR2	4000		
15	SYS_EVENT_DESC_LANG2	Y	VARCHAR2	4000		
16	SYS_EVENT_DESC_LANG3	Y	VARCHAR2	4000		
17	SYS_EVENT_DESC_LANG4	Y	VARCHAR2	4000		
18	SYS_EVENT_DESC_LANG5	Y	VARCHAR2	4000		
19	SYS_FUTUREUSE1	Y	NUMBER	1,0		
20	SYS_FUTUREUSE2	Y	NUMBER	1,0		
21	SYS_FUTUREUSE3	Y	NUMBER	1,0		
22	SYS_FUTUREUSE4	Y	NUMBER	1,0		
23	SYS_FUTUREUSE5	Y	NUMBER	1,0		
24	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
25	ORGANIZATION_ID	Y	VARCHAR2	32		Organization identifier.
26	ORGANIZATION_NAME	Y	VARCHAR2	256		Organization name.
27	ORGANIZATION_LOCATION	Y	VARCHAR2	10		Organizational descriptive location/jurisdication.
28	ORGANIZATION_FUNCTION	Y	VARCHAR2	10		
29	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
30	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256		
31	MESSAGE_TYPE_ID	N	VARCHAR2	3		
32	MESSAGE_TYPE_VERSION	N	NUMBER	38,0		
33	MESSAGE_NUMBER	N	NUMBER	38,0		
34	MESSAGE_TIMESTAMP	N	TIMESTAMP(6) WITH	13		
35	MESSAGE_EXPIRY_TIME	Y	TIMESTAMP(6) WITH	13		
36	EVENT_ID	N	VARCHAR2	32		
37	EVENT_UPDATE	Y	NUMBER	38,0		
38	RESPONSE_PLAN_ID	Y	VARCHAR2	32		
39	EVENT_UPDATE_TIME	N	TIMESTAMP(6) WITH	13		
40	EVENT_STATUS	Y	VARCHAR2	32		
41	DURATION_EXCEED_FLAG	Y	NUMBER	1,0		
42	PRIORITY_LEVEL	Y	NUMBER	2,0		
43	SEVERITY	N	VARCHAR2	32		
44	IMPACT_LEVEL	Y	NUMBER	2,0		
45	ACTIVE_FLAG	Y	VARCHAR2	32		
46	PLANNED_EVENT_CLASS	Y	VARCHAR2	32		

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI EVENTS
Tablespace ATIS_DATA

	Column	Null?	Type		Comments
47	HEADLINE_EVENT_TYPE	Y	VARCHAR2	32	
48	HEADLINE_EVENT_SUBTYPE	Y	VARCHAR2	256	
49	HEADLINE_ELEMENT	Y	VARCHAR2	256	
50	ELEMENT_ID	Y	NUMBER	3,0	
51	SCHEDULE_ELEMENT_ID	Y	NUMBER	3,0	
52	EVENT_CATEGORY	Y	VARCHAR2	32	
53	SOURCE_ORGANIZATION_ID	Y	VARCHAR2	32	
54	EVENT_DETECTION_METHOD	Y	VARCHAR2	32	
55	EVENT_LOCATION_TYPE	Y	VARCHAR2	32	
56	AREA_ID	Y	VARCHAR2	32	
57	AREA_NAME	Y	VARCHAR2	256	
58	LOCATION_RANK	Y	NUMBER	2,0	
59	UPWARD_AREA_ID	Y	VARCHAR2	32	
60	UPWARD_AREA_NAME	Y	VARCHAR2	256	
61	LINK_OWNERSHIP	Y	VARCHAR2	256	
62	LINK_DESIGNATOR	Y	VARCHAR2	64	Roadway identifier.
63	SCNDRY_LINK_DESIGNATOR	Y	VARCHAR2	64	
64	LINK_ID	Y	VARCHAR2	32	Link identifier.
65	LINK_NAME	Y	VARCHAR2	256	Travel time segment name.
66	PRIMARY_LATITUDE	N	NUMBER	9,0	Latitude.
67	PRIMARY_LONGITUDE	N	NUMBER	10,0	Longitude.
68	PRIMARY_HORIZDATUM	Y	VARCHAR2	32	
69	PRIMARY_UPWARD_AREA_ID	Y	VARCHAR2	32	
70	PRIMARY_UPWARD_AREA_NAME	Y	VARCHAR2	256	
71	PRIMARY_LINEAR_REFERENCE	Y	VARCHAR2	4000	
72	PRIMARY_LINK_NAME	Y	VARCHAR2	256	Travel time segment name.
73	PRIMARY_POINT_NAME	Y	VARCHAR2	256	
74	PRIMARY_XSTREET_DESIGNATOR	Y	VARCHAR2	64	Roadway identifier.
75	PRIMARY_XSTREET_NAME	Y	VARCHAR2	256	
76	PRIMARY_SIGNED_DESTINATION	Y	VARCHAR2	256	
77	PRIMARY_LOCATION_RANK	Y	VARCHAR2	10	
78	PRIMARY_LANDMARK_TYPE	Y	VARCHAR2	10	
79	SECONDARY_LATITUDE	Y	NUMBER	9,0	Latitude.
80	SECONDARY_LONGITUDE	Y	NUMBER	10,0	Longitude.
81	SECONDARY_HORIZDATUM	Y	VARCHAR2	32	
82	SECONDARY_UPWARD_AREA_ID	Y	VARCHAR2	32	
83	SECONDARY_UPWARD_AREA_NAME	Y	VARCHAR2	256	
84	SECONDARY_LINEAR_REFERENCE	Y	VARCHAR2	4000	
85	SECONDARY_LINK_NAME	Y	VARCHAR2	256	Travel time segment name.
86	SECONDARY_POINT_NAME	Y	VARCHAR2	256	
87	SECONDARY_XSTREET_DESIGNATOR	Y	VARCHAR2	64	Roadway identifier.
88	SECONDARY_XSTREET_NAME	Y	VARCHAR2	256	
89	SECONDARY_SIGNED_DESTINATION	Y	VARCHAR2	256	
90	SECONDARY_LOCATION_RANK	Y	VARCHAR2	10	
91	SECONDARY_LANDMARK_TYPE	Y	VARCHAR2	10	
92	LINK_DIRECTION	Y	VARCHAR2	32	Roadway direction of travel.

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI EVENTS
Tablespace ATIS_DATA

	Column	Null?	Type	D	Comments
93	LINK_ALIGNMENT	Y	VARCHAR2	32	
94	LINEAR_REFERENCE_VERSION	Y	NUMBER	3,0	
95	LANDMARK_TYPE	Y	VARCHAR2	10	
96	LANDMARK_NAME	Y	VARCHAR2	256	
97	LANDMARK_POINT_NAME	Y	VARCHAR2	256	
98	LANDMARK_LOCATION_RANK	Y	VARCHAR2	10	
99	LANDMARK_LATITUDE	Y	NUMBER	9,0	
##	LANDMARK_LONGITUDE	Y	NUMBER	10,0	
##	LANDMARK_HORIZDATUM	Y	VARCHAR2	32	
##	LANDMARK_UPWARD_AREA_ID	Y	VARCHAR2	32	
##	LANDMARK_UPWARD_AREA_NAME	Y	VARCHAR2	256	
##	LATITUDE	Y	NUMBER	9,0	
##	LONGITUDE	Y	NUMBER	10,0	
##	HORIZDATUM	Y	VARCHAR2	32	
##	UPDATE_TIME	Y	TIMESTAMP(6) WITH	13	
##	VALID_PERIOD_EXPECTED_END_TIME	Y	TIMESTAMP(6) WITH	13	
##	ESTIMATED_DURATION	Y	NUMBER	38,0	
##	SEQUENCE_TIME	Y	TIMESTAMP(6) WITH	13	
##	START_TIME	Y	TIMESTAMP(6) WITH	13	
##	ALTERNATE_START_TIME	Y	TIMESTAMP(6) WITH	13	
##	ALTERNATE_END_TIME	Y	TIMESTAMP(6) WITH	13	
##	EXPECTED_END_TIME	Y	TIMESTAMP(6) WITH	13	
##	RECURRENT_TIMES_SEQ	Y	VARCHAR2	4000	
##	PLANNED_EVENT_CONTINUOUS_FLAG	Y	NUMBER	1,0	
##	EVENT_NAME	Y	VARCHAR2	256	
##	LANES_TYPE	Y	VARCHAR2	32	
##	LANES_LINK_DIRECTION	Y	VARCHAR2	32	
##	LANES_TOTAL_ORIGINAL	Y	NUMBER	3,0	
##	LANES_TOTAL_AFFECTED	Y	NUMBER	3,0	
##	LANES_STATUS	Y	VARCHAR2	32	
##	CONFIDENCE_LEVEL	Y	VARCHAR2	32	
##	ACCESS_LEVEL	Y	VARCHAR2	32	
##	EVENT_COMMENT	Y	VARCHAR2	4000	
##	OPERATOR_ID	Y	VARCHAR2	32	
##	OPERATOR_COMMENT	Y	VARCHAR2	4000	
##	COMMENT_LANGUAGE	Y	VARCHAR2	32	
##	NETWORK_ID	Y	VARCHAR2	32	
##	LOCATION_ID	Y	VARCHAR2	32	
##	ALTERNATE_ROUTE_DESCRIPTION	Y	VARCHAR2	256	
##	EVENT_TIMELINE_SCHEDULE_DOW_1	Y	RAW	1	
##	EVENT_TIMELINE_SCHEDULE_DOW_2	Y	RAW	1	
##	EVENT_TIMELINE_SCHEDULE_DOW_3	Y	RAW	1	
##	EVENT_TIMELINE_SCHEDULE_DOW_4	Y	RAW	1	
##	EVENT_TIMELINE_SCHEDULE_DOW_5	Y	RAW	1	
##	EVENT_TIMELINE_SCHEDULE_DOW_6	Y	RAW	1	
##	EVENT_TIMELINE_SCHEDULE_DOW_7	Y	RAW	1	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI EVENTS
Tablespace ATIS_DATA

Primary/Unique Constraint Name	Constraint Column
EV_PK	1 ORGANIZATION_CENTER_ID 2 EVENT_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
AVCON_1182198907_SYS_I_000	sys_is_fullclosure IN (0, 1)
AVCON_1193693223_EVENT_000	EVENT_CATEGORY IN ('planned', 'current', 'forecast')
AVCON_1193693223_EVENT_001	SEVERITY IN ('unknown', 'minor', 'intermediate', 'major')
AVCON_1193693223_LINK__005	LINK_DIRECTION IN ('n', 'ne', 'e', 'se', 's', 'sw', 'w', 'nw', 'not directional', 'positive direction', 'negative direction', 'both directions')
AVCON_1193693223_MESSA_000	MESSAGE_TYPE_ID IN ('BEU', 'FEU')

Index Name	Part	Uniqueness	Indexed Column	Sort
EV_PK	NO	UNIQUE	1 ORGANIZATION_CENTER_ID 2 EVENT_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI FLOODGATE_MESSAGES
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH13			Timestamp of when record is written to database.
2	SYS_LANG_ID	Y	NUMBER	38,0		
3	SYS_FUTUREUSE1	Y	NUMBER	1,0		
4	SYS_FUTUREUSE2	Y	NUMBER	1,0		
5	SYS_FUTUREUSE3	Y	NUMBER	1,0		
6	SYS_FUTUREUSE4	Y	NUMBER	1,0		
7	SYS_FUTUREUSE5	Y	NUMBER	1,0		
8	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH13			
9	ORGANIZATION_ID	Y	VARCHAR2	32		Organization identifier.
10	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
11	FLOODGATE_ID	N	VARCHAR2	32		
12	LANG_CODE	N	VARCHAR2	32		
13	WEB_BANNER_TEXT	N	VARCHAR2	4000		
14	MESSAGE_TEXT	N	VARCHAR2	4000		
15	MESSAGE_SPEECH	Y	BLOB	4000		

Primary/Unique Constraint Name	Constraint Column
FGM_PK	1 ORGANIZATION_CENTER_ID
	2 FLOODGATE_ID
	3 LANG_CODE
FGM_UK	1 ORGANIZATION_CENTER_ID
	2 FLOODGATE_ID
	3 SYS_LANG_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
FGM_PK	NO	UNIQUE	1 ORGANIZATION_CENTER_ID	
			2 FLOODGATE_ID	
			3 LANG_CODE	
FGM_UK	NO	UNIQUE	1 ORGANIZATION_CENTER_ID	
			2 FLOODGATE_ID	
			3 SYS_LANG_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI FLOODGATES
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		Timestamp of when record is written to database.
2	SYS_AREA_ID	Y	VARCHAR2	32		
3	SYS_DOW_ID	Y	NUMBER	38,0		
4	SYS_DOW_RAW	Y	RAW	1		
5	SYS_TOD_ID	Y	NUMBER	38,0		
6	SYS_TOD_RAW	Y	RAW	1		
7	SYS_EVENTTYPE_ID	Y	NUMBER	38,0		
8	SYS_EVENTTYPE_CODE	Y	VARCHAR2	32		
9	SYS_EVENTTYPE_RAW	Y	RAW	1		
10	SYS_SEVERITY_ID	Y	NUMBER	38,0		
11	SYS_SEVERITY_CODE	Y	VARCHAR2	32		
12	SYS_SEVERITY_RAW	Y	RAW	1		
13	SYS_IS_FULLCLOSURE	Y	NUMBER	1,0		
14	SYS_FLOODGATE_DESC_LANG1	Y	VARCHAR2	4000		
15	SYS_FLOODGATE_DESC_LANG2	Y	VARCHAR2	4000		
16	SYS_FLOODGATE_DESC_LANG3	Y	VARCHAR2	4000		
17	SYS_FLOODGATE_DESC_LANG4	Y	VARCHAR2	4000		
18	SYS_FLOODGATE_DESC_LANG5	Y	VARCHAR2	4000		
19	SYS_FUTUREUSE1	Y	NUMBER	1,0		
20	SYS_FUTUREUSE2	Y	NUMBER	1,0		
21	SYS_FUTUREUSE3	Y	NUMBER	1,0		
22	SYS_FUTUREUSE4	Y	NUMBER	1,0		
23	SYS_FUTUREUSE5	Y	NUMBER	1,0		
24	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
25	ORGANIZATION_ID	Y	VARCHAR2	32		Organization identifier.
26	ORGANIZATION_NAME	Y	VARCHAR2	256		Organization name.
27	ORGANIZATION_LOCATION	Y	VARCHAR2	10		Organizational descriptive location/jurisdication.
28	ORGANIZATION_FUNCTION	Y	VARCHAR2	10		
29	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
30	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256		
31	FLOODGATE_ID	N	VARCHAR2	32		
32	FLOODGATE_TYPE	Y	VARCHAR2	32		
33	SEVERITY	N	VARCHAR2	32		
34	BARGE_IN	N	NUMBER	1,0		
35	END_CALL	N	NUMBER	1,0		
36	COUNTY_ID	Y	VARCHAR2	32		Not used. SunGuide specific county identifier.
37	COUNTY_NAME	Y	VARCHAR2	256		County name.
38	CITY_ID	Y	VARCHAR2	32		Not used. SunGuide specific city identifier.
39	CITY_NAME	Y	VARCHAR2	256		City name.
40	ROUTE_DESIGNATOR	Y	VARCHAR2	64		
41	LINK_DIRECTION	Y	VARCHAR2	32		
42	NETWORK_ID	Y	VARCHAR2	32		
43	LOCATION_ID	Y	VARCHAR2	32		
44	LINK_ID	Y	VARCHAR2	32		Link identifier.
45	LAST_UPDATE_TIME	N	TIMESTAMP(6) WITH	13		Source timestamp of record update.

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI FLOODGATES
Tablespace ATIS_DATA

Primary/Unique Constraint Name	Constraint Column
FG_PK	1 ORGANIZATION_CENTER_ID 2 FLOODGATE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
FG_DIR_CH	LINK_DIRECTION IN ('n', 'ne', 'e', 'se', 's', 'sw', 'w', 'nw', 'not directional', 'positive direction', 'negative direction', 'both directions')

Index Name	Part	Uniqueness	Indexed Column	Sort
FG_PK	NO	UNIQUE	1 ORGANIZATION_CENTER_ID 2 FLOODGATE_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI LOCATION_INVENTORIES
Tablespace INVENTORY_DATA

	Column	Null?	Type		Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13	Timestamp of when record is written to database.
2	SYS_AREA_ID	Y	VARCHAR2	32	
3	SYS_FUTUREUSE1	Y	NUMBER	1,0	
4	SYS_FUTUREUSE2	Y	NUMBER	1,0	
5	SYS_FUTUREUSE3	Y	NUMBER	1,0	
6	SYS_FUTUREUSE4	Y	NUMBER	1,0	
7	SYS_FUTUREUSE5	Y	NUMBER	1,0	
8	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13	
9	ORGANIZATION_ID	Y	VARCHAR2	32	Organization identifier.
10	ORGANIZATION_NAME	Y	VARCHAR2	256	Organization name.
11	ORGANIZATION_LOCATION	Y	VARCHAR2	10	Organizational descriptive location/jurisdication.
12	ORGANIZATION_FUNCTION	Y	VARCHAR2	10	
13	ORGANIZATION_CENTER_ID	N	VARCHAR2	32	
14	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256	
15	NETWORK_ID	N	VARCHAR2	32	
16	NETWORK_NAME	Y	VARCHAR2	256	
17	LOCATION_ID	N	VARCHAR2	32	
18	ROADWAY_ID	N	VARCHAR2	32	
19	LINK_DIRECTION	N	VARCHAR2	32	
20	SORT_ORDER	N	NUMBER	22	
21	LOCATION_NAME	N	VARCHAR2	256	
22	LATITUDE	N	NUMBER	9,0	
23	LONGITUDE	N	NUMBER	10,0	
24	HORIZDATUM	Y	VARCHAR2	32	
25	NEAREST_XSTREET_REFERENCE_ID	N	VARCHAR2	64	
26	NEAREST_XSTREET_NAME	N	VARCHAR2	256	
27	NEAREST_XSTREET_OFFSETTYPE	N	VARCHAR2	64	
28	NEAREST_XSTREET_OFFSET	N	NUMBER	32,0	
29	SECONDARY_LOCATION_REF_ID	N	VARCHAR2	64	
30	SECONDARY_LOCATION_NAME	N	VARCHAR2	256	
31	SECONDARY_LOCATION_OFFSETTYPE	N	VARCHAR2	64	
32	SECONDARY_LOCATION_OFFSET	N	NUMBER	32,0	
33	EXIT_NUMBER	Y	VARCHAR2	32	
34	EXIT_SUFFIX	Y	VARCHAR2	32	
35	COUNTY_ID	N	VARCHAR2	32	
36	COUNTY_NAME	N	VARCHAR2	256	
37	CITY_ID	N	VARCHAR2	32	
38	CITY_NAME	N	VARCHAR2	256	
39	ALTERNATE_ROUTE_1_ID	Y	VARCHAR2	32	
40	ALTERNATE_ROUTE_1_DESCRIPTION	Y	VARCHAR2	256	
41	ALTERNATE_ROUTE_2_ID	Y	VARCHAR2	32	
42	ALTERNATE_ROUTE_2_DESCRIPTION	Y	VARCHAR2	256	
43	LAST_UPDATE_TIME	N	TIMESTAMP(6) WITH	13	Source timestamp of record update.

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI LOCATION_INVENTORIES
Tablespace INVENTORY_DATA

Primary/Unique Constraint Name	Constraint Column
NDI_PK	1 NETWORK_ID
	2 LOCATION_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
AVCON_1193693223_LOCATION__001	LINK_DIRECTION IN ('n', 'ne', 'e', 'se', 's', 'sw', 'w', 'nw', 'not directional', 'positive direction', 'negative direction', 'both directions')

Index Name	Part	Uniqueness	Indexed Column	Sort
NDI_PK	NO	UNIQUE	1 NETWORK_ID	
			2 LOCATION_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI NCACHE_DB_SYNC
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	CACHE_KEY	N	VARCHAR2	256		
2	CACHE_ID	N	VARCHAR2	256		
3	CHANGECOUNT	Y	NUMBER	22		

Primary/Unique Constraint Name	Constraint Column
SYS_C009763	1 CACHE_KEY 2 CACHE_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
SYS_C009763	NO	UNIQUE	1 CACHE_KEY 2 CACHE_ID	

ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI NCACHE_INSERT_SYNC
Tablespace ATIS_DATA

	Column	Null?	Type		D	Comments
1	TABLE_KEY	Y	VARCHAR2	256		
2	NEW_PRIMARY_KEY	Y	VARCHAR2	256		

Primary/Unique Constraint Name	Constraint Column

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
IDX_NCACHE_IN	NO		1 TABLE_KEY	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI ROADWAY_INVENTORIES
Tablespace INVENTORY_DATA

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
2	SYS_FUTUREUSE1	Y	NUMBER	1,0		
3	SYS_FUTUREUSE2	Y	NUMBER	1,0		
4	SYS_FUTUREUSE3	Y	NUMBER	1,0		
5	SYS_FUTUREUSE4	Y	NUMBER	1,0		
6	SYS_FUTUREUSE5	Y	NUMBER	1,0		
7	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
8	ORGANIZATION_ID	Y	VARCHAR2	32		
9	ORGANIZATION_NAME	Y	VARCHAR2	256		
10	ORGANIZATION_LOCATION	Y	VARCHAR2	10		
11	ORGANIZATION_FUNCTION	Y	VARCHAR2	10		
12	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
13	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256		
14	NETWORK_ID	N	VARCHAR2	32		
15	NETWORK_NAME	Y	VARCHAR2	256		
16	ROADWAY_ID	N	VARCHAR2	32		
17	ROADWAY_NAME	N	VARCHAR2	256		
18	LAST_UPDATE_TIME	N	TIMESTAMP(6) WITH	13		

Primary/Unique Constraint Name	Constraint Column
RWI_PK	1 NETWORK_ID
	2 ROADWAY_ID

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column	Sort
RWI_PK	NO	UNIQUE	1 NETWORK_ID	
			2 ROADWAY_ID	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI ROUTE_INVENTORIES
Tablespace INVENTORY_DATA

Travel time routes as defined by agencies (previously called LINK_INVENTORIES). Route represents FDOT SunGuide TVT link.

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		Timestamp of when record is written to database.
2	SYS_AREA_ID	Y	VARCHAR2	32		
3	SYS_ENCODED_POLYLINE	Y	VARCHAR2	4000		
4	SYS_FUTUREUSE1	Y	NUMBER	1,0		
5	SYS_FUTUREUSE2	Y	NUMBER	1,0		
6	SYS_FUTUREUSE3	Y	NUMBER	1,0		
7	SYS_FUTUREUSE4	Y	NUMBER	1,0		
8	SYS_FUTUREUSE5	Y	NUMBER	1,0		
9	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
10	ORGANIZATION_ID	Y	VARCHAR2	32		Organization identifier.
11	ORGANIZATION_NAME	Y	VARCHAR2	256		Organization name.
12	ORGANIZATION_LOCATION	Y	VARCHAR2	10		Organizational descriptive location/jurisdication.
13	ORGANIZATION_FUNCTION	Y	VARCHAR2	10		
14	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
15	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256		
16	NETWORK_ID	N	VARCHAR2	32		
17	NETWORK_NAME	Y	VARCHAR2	256		
18	ROUTE_ID	N	VARCHAR2	32		
19	ROUTE_TYPE	N	VARCHAR2	32		
20	ROUTE_NAME	N	VARCHAR2	256		Roadway name.
21	ALTERNATIVE_ROUTE_NAME	Y	VARCHAR2	256		
22	ROUTE_LENGTH	Y	NUMBER	38,0		
23	ROUTE_URL	Y	VARCHAR2	128		
24	LAST_UPDATE_TIME	N	TIMESTAMP(6) WITH	13		Source timestamp of record update.
25	ROADWAY_ID	Y	VARCHAR2	32		Roadway identifier.
26	LINK_DIRECTION	Y	VARCHAR2	32		Roadway direction of travel.
27	ROUTE_BEGIN_NODE_ID	Y	VARCHAR2	32		
28	ROUTE_BEGIN_LATITUDE	Y	NUMBER	9,0		
29	ROUTE_BEGIN_LONGITUDE	Y	NUMBER	10,0		
30	ROUTE_END_NODE_ID	Y	VARCHAR2	32		
31	ROUTE_END_LATITUDE	Y	NUMBER	9,0		
32	ROUTE_END_LONGITUDE	Y	NUMBER	10,0		
33	MIDPOINTS	Y	TYPE_MIDPOINT_TA	16		
34	ROUTE_LINK_ID_LIST	Y	TYPE_TRNSPRTTN_N	16		
35	ALTERNATIVE_ROUTE_NAME_LIST	Y	TYPE_TRNSPRTTN_N	16		
36	ROUTE_NODE_ID_LIST	Y	TYPE_TRNSPRTTN_N	16		

Primary/Unique Constraint Name	Constraint Column
RTI_PK	1 NETWORK_ID
	2 ROUTE_ID
SYS_C009723	1 SYS_NC0003900040$
SYS_C009724	1 SYS_NC0003700038$
SYS_C009725	1 SYS_NC0003500036$
SYS_C009726	1 SYS_NC0003300034$

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table	**TI**	**ROUTE_INVENTORIES**
Tablespace	**INVENTORY_DATA**	

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition
RTI_RTTYP_CH	route_type IN ('travel','transit','detour','alternate','evacuation','snow','emergency vehicles','managed lanes','flood','scenic','hazmat','truck','bicycle','walking')

Index Name	Part	Uniqueness	Indexed Column		Sort
RTI_PK	NO	UNIQUE	1	NETWORK_ID	
			2	ROUTE_ID	
SYS_C009723	NO	UNIQUE	1	ROUTE_NODE_ID_LIST	
SYS_C009724	NO	UNIQUE	1	ALTERNATIVE_ROUTE_NAME_LIST	
SYS_C009725	NO	UNIQUE	1	ROUTE_LINK_ID_LIST	
SYS_C009726	NO	UNIQUE	1	MIDPOINTS	

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table TI ROUTE_STATUSES
Tablespace INVENTORY_DATA

Current travel time of defined route (previously called LINK_STATUSES).

	Column	Null?	Type		D	Comments
1	SYS_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		Timestamp of when record is written to database.
2	SYS_LEVELOFSERVICE_ID	Y	NUMBER	38,0		
3	SYS_LEVELOFSERVICE_CODE	Y	VARCHAR2	32		
4	SYS_LEVELOFSERVICE_RAW	Y	RAW	1		
5	SYS_FUTUREUSE1	Y	NUMBER	1,0		
6	SYS_FUTUREUSE2	Y	NUMBER	1,0		
7	SYS_FUTUREUSE3	Y	NUMBER	1,0		
8	SYS_FUTUREUSE4	Y	NUMBER	1,0		
9	SYS_FUTUREUSE5	Y	NUMBER	1,0		
10	BATCH_TIMESTAMP	Y	TIMESTAMP(6) WITH	13		
11	ORGANIZATION_ID	Y	VARCHAR2	32		Organization identifier.
12	ORGANIZATION_NAME	Y	VARCHAR2	256		Organization name.
13	ORGANIZATION_LOCATION	Y	VARCHAR2	10		Organizational descriptive location/jurisdication.
14	ORGANIZATION_FUNCTION	Y	VARCHAR2	10		
15	ORGANIZATION_CENTER_ID	N	VARCHAR2	32		
16	ORGANIZATION_CENTER_NAME	Y	VARCHAR2	256		
17	NETWORK_ID	N	VARCHAR2	32		
18	ROUTE_ID	N	VARCHAR2	32		
19	ROUTE_STATUS	N	VARCHAR2	32		
20	ROUTE_NAME	Y	VARCHAR2	256		
21	DETOUR_ROUTE_IN_EFFECT_FLAG	Y	NUMBER	1,0		
22	SURFACE_CONDITION	Y	VARCHAR2	32		
23	ROUTE_CAPACITY	Y	NUMBER	38,0		
24	LEVEL_OF_SERVICE	Y	VARCHAR2	32		
25	SATUATION_FLAG	Y	NUMBER	1,0		
26	ROUTE_DATA_STORED_TYPE	Y	VARCHAR2	32		
27	ROUTE_TRAFFIC_DATA_ALGO	Y	VARCHAR2	32		
28	DELAY	Y	NUMBER	38,0		
29	ALTERNATE_ROUTE_DELAY	Y	NUMBER	38,0		
30	HEADWAY	Y	NUMBER	38,0		
31	TRAVEL_TIME	Y	NUMBER	38,0		
32	TRAVEL_TIME_INCREASE	Y	NUMBER	3,0		
33	VOLUME	Y	NUMBER	38,0		
34	SPEED_AVERAGE	Y	NUMBER	3,0		
35	DENSITY	Y	NUMBER	22		
36	OCCUPANCY	Y	NUMBER	38,0		
37	CURRENT_SPEED_ADVISORY	Y	NUMBER	38,0		
38	EVENT_DESCRIPTION_TIME	Y	NUMBER	38,0		
39	LAST_UPDATE_TIME	N	TIMESTAMP(6) WITH	13		Source timestamp of record update.
40	LINK_DIRECTION	Y	VARCHAR2	32		Roadway direction of travel.

Primary/Unique Constraint Name	Constraint Column
RTS_PK	1 NETWORK_ID
	2 ROUTE_ID

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ATIS-Database Schema

July 24, 2008 v0.02 (ATIS-DB-DEV1)

Schema Owner / Table	**TI**	**ROUTE_STATUSES**
Tablespace	**INVENTORY_DATA**	

Foreign Constraint Name	Table Name	Del?	Constraint Column

Check Constraint Name	Condition

Index Name	Part	Uniqueness	Indexed Column		Sort
RTS_PK	NO	UNIQUE	1	NETWORK_ID	
			2	ROUTE_ID	

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1.2 Schema ATIS_PRODUCT

There are no objects in this schema. There are no end-user presentation ("products") in additional those provided by FLATIS Data Fusion Subsystem.

This schema may not be required if additional aggregation is required.

Table 9: Schema ATIS_PRODUC

Entity: SUBSCRIBER_ROUTE_STATUSES (T.B.D.) .	Aggregated statistics for subscriber defined routes Note: Segment sorting is not relevant.
route_id (PK)	System-generated subscriber route identifier
total_traveltime	Total aggregated travel time for defined route
average_speed	Average route speed
total_occupancy	Total aggregated occupancy for defined route
total_volume	Total aggregated volume for defined route

1.3 Schema ATIS_SUBSCRIPTION

Table 10: Schema ATIS_SUBSCRIPTION

Entity: SUBSCRIBERS (LT's user profile)	Stores personal information of valid FLATIS 511 user (subscriber). Note: E-mail and SMS addresses for alerts are stored with individual user profiles.
subscriber_id	PK
phoneno_1	Primary phone number for IVR
phoneno_2	Secondary phone number for IVR
user_name	Subscriber submitted account name for online access to your account
encrypted_password	Password is used only for online access to your account
secretquestion_type	Selected secret question
encrypted_secretanswer	Answer to secret question
email_address	E-mail address used to send you forgotten passwords
preferred_language	Default communication language for IVR, website

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	and alerts
preferred_imageresolution	Default CCTV images/videos resolution/size which is related to user bandwidth connectivity to ATIS website (low, medium, high)
Entity: SUBSCRIBER_PROFILES	**Association of subscriber and user profile(s). Each profile contains highways (or roads) and ATIS Reporting Segments.**
subscriber_id (PK)	Subscriber identifier
profile_type (PK)	Profile type ("to work", "to home", etc.)
profile_name	User defined name
route_id	System-generated route identifier
sorted_links	Collection of user-sorted ATIS Reporting Segment play order (required by Logictree's MyFlorida511)
Alert_Phone_number1	
Alert_Phone_number1_Event_Type	
Alert_Phone_number1_Event_Severity	Event severity alert filter
Alert_Phone_number1_Event_Days	
Alert_Phone_number1_Event_Time	
Alert_Phone_number1_Routes	
Alert_Phone_number2	
Alert_Phone_number2_Event_Type	
Alert_Phone_number2_Event_Severity	Event severity alert filter
Alert_Phone_number2_Event_Days	
Alert_Phone_number2_Event_Time	
Alert_Phone_number2_Routes	
Alert_sms	
Alert_sms _Event_Type	
Alert_sms _Event_Severity	Event severity alert filter
Alert_sms_Event_Days	
Alert_sms_Event_Time	
Alert_sms_Routes	
Alert_email1	
Alert_ email1_Event_Type	
Alert_ email1_Event_Severity	Event severity alert filter

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Alert_ email1_Event_Days	
Alert_ email1_Event_Time	
Alert_ email1_Routes	
Alert_email2	
Alert_ email2_Event_Type	
Alert_ email2_Event_Severity	Event severity alert filter
Alert_ email2_Event_Days	
Alert_ email2_Event_Time	
Alert_ email2_Routes	
Entity: ROUTES (LT's maintainroute_segment) Note: Routes can be referenced by more than 1 subscriber. Segment sorting by individual users is not stored here	**Stores highways (or roads) and their associated ATIS Reporting Segment as created by subscribers.**
route_id (PK)	System-generated subscriber route identifier
roadway	Name of highway or road.
Road_sequence_number	Roadway sequence number within route
travel_direction	Roadway direction of travel
em_locations	Ordered collection of em locations for each roadway defined in making up the route.
Em_cnt	Number of EM Locations on specific roadway of a the route
link_cnt	Number of ATIS Reporting Segments in user route
links	Collections of unsorted ATIS Reporting Segment identifiers
total_length	Total aggregated travel length of ATIS Reporting Segments
active_subscriber_cnt	Number of active subscriber that references this route.

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1.4 Schema ADMIN PORTAL

Table 11: Schema ADMIN PORTAL

Entity: USERS	Stores personal information of valid FLATIS 511admin user.
user_id	PK
user_name	Subscriber submitted account name for online access to your account
encrypted_password	Password is used only for online access to your account
organization	
Email	
Permissions	
Enabled	
LastUpdateTime	
Entity: LINKS	
Link id(PK)	Subscriber identifier
Link_category	
Link_description_English	
Link_description_Spanish	
Link_url_english	
Link_url_spanish	
Admin_update_name	
Update_time	
Entity: Speed Colors	
Speed_id(PK)	System-generated subscriber route identifier
Current colour (RGB)	Name of highway or road.
Last_edited_by	
Last_update_time	
Entity: messages	
Message id(PK)	Subscriber identifier
Message_type	Floodgate, over-ride, welcome
Message_text_english	

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Message_text_spanish	
Last_edited_by	
Last_update_time	

1.5 Schema ATIS_SYSTEM

Table 12: Schema ADMIN PORTAL

Entity: USER_PROFILES (LT"s availableprofiles)	Stores predefined subscriber profile categories.
Entity: ALERT_TIMEPERIODS	Stores predefined subscriber alert time period types: AM Peak, Mid-day, PM Peak, etc
Entity: ALERT_DAYOFWEEKS (LT"s availableprofiles)	Stores predefined day of week types for subscriber alerts.
Entity: LANGUAGES	Stores predefined selectable languages for subscriber preferences.
Entity: IMAGERESOLUTIONS	Stores predefined selectable image and video resolution/size for subscriber preferences.
Entity: SECRETQUESTIONS	Stores predefined selectable secret question categories for subscriber account setup.
Entity: SYSTEM_PARAMETERS	

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2 Incident Report Examples

Table 13: Report on an Accident on an entire roadway

Report on an Accident on an entire roadway	
Phrases	**Reference to EM Codes & Data tables**
[Accident]	(EM code 201 (in sequencing spreadsheet))
[State Road 417]	(NODE_INVENTORIES.NODE_ROUTE_DESIGNATOR)
[southbound]	(NODE_INVENTORIES.NODE_DIRECTION)
[at]	(2b. connecting phraseology (in sequencing spreadsheet))
[exit 50 US 17-92]	(3. Read-out EM location information...)
[off-ramp closed]	(6. off-Ramp, EM code 407)
[Last updated]	(10. connecting phraseology)
[at 9 am]	(Read-out Event Time Stamp)
Report readout: *""Report 2. Accident, State Road 417 southbound. At exit 50, US 17-92. Off-ramp closed. Last updated at 9 am.”."*	

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Table 14: Report on Road Construction on an entire roadway

Report on Road Construction on an entire roadway	
Phrases	**Reference to EM Codes & Data tables**
[Road construction]	(EM code 701 (in sequencing spreadsheet))
[State Road 417]	(NODE_INVENTORIES.NODE_ROUTE_DESIGNATOR)
[southbound]	(NODE_INVENTORIES.NODE_DIRECTION)
[1 mile]	(2a. EM location distance (in sequencing spreadsheet))
[before]	(2b. connecting phraseology)
[State Road 408]	(3. Read-out EM location information...)
[Express lane closed]	(7. Lane closure. EM code 482)
[Last updated	(10. connecting phraseology)
[at 11 am]	(Read-out Event Time Stamp)
Report readout: *""Report 3. Road construction, State Road 417 southbound. 1 mile before State Road 408. Express lane closed. Last updated at 11 am."*	

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Table 15: Report on Disabled vehicle on one location on an interstate

Report on Disabled vehicle on one location on an interstate	
Phrases	**Reference to EM Codes & Data tables**
[Disabled vehicle]	(EM code 211 (in sequencing spreadsheet))
[US-75]	(NODE_INVENTORIES.NODE_ROUTE_DESIGNATOR)
[southbound]	(NODE_INVENTORIES.NODE_DIRECTION)
[2 miles]	(2a. EM location distance (in sequencing spreadsheet))
[beyond]	(2b. connecting phraseology)
[exit 55]	(3. Read-out EM location information...)
[Left lane blocked]	(7. Lane closure)
[Last updated]	(10. connecting phraseology)
[at 11 am]	(Read-out Event Time Stamp)
Report readout: *"Disabled vehicle, US-75 southbound. 2 miles beyond exit 55. Left lane blocked. Last updated at 1 pm."*	

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Table 16: Report on Weather event due to flooding on a city

Report on Weather event due to flooding on a city	
Phrases	**Reference to EM Codes & Data tables**
[Weather event due to flooding]	(EM code 2098 (in sequencing spreadsheet))
[I-75]	(NODE_INVENTORIES.NODE_ROUTE_DESIGNATOR)
[northbound]	(NODE_INVENTORIES.NODE_DIRECTION)
[1 mile]	(2a. EM location distance (in sequencing spreadsheet))
[before]	(2b. connecting phraseology (in sequencing spreadsheet))
[Exit 7A, Miramar Parkway east]	(3. Read-out EM location information...)
[2 right lanes blocked]	(7. Lane Closure, EM code 2100 + optional qualifier)
[Suggested alternate road]	(8. connecting phraseology)
[Florida's Turnpike Homestead Extension]	(Read-out Alternate Road Information)
[Last updated]	(10. connecting phraseology)
[at 2 am]	(Read-out Event Time Stamp)
Report readout: *"Report 1. Weather event, I-75 northbound. 1 mile before exit 7A, Miramar Parkway east. 2 right lanes blocked. Suggested alternate road: Florida's Turnpike Homestead Extension. Last updated at 2 am."*	

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3 E&M Source Sequencing Table

Draft EM Code Sequencing.xls

File 2: Draft EM Code Sequencing

1. MESSAGE_CODE	
SAE Message code group 1	
value	**prompt**
30	Accident involving a tractor-trailer
47	Disabled tractor-trailer
61	Object on roadway
93	Overturned tractor-trailer
95	Planned construction
136	Traffic congestion
201	Accident
203	Multi-vehicle accident
204	Accident involving truck
205	Accident involving hazardous materials
211	Disabled vehicle
212	Disabled truck
213	Vehicle on fire
214	Incident
335	Accident involving bus
346	Disabled bus
701	Road construction
707	Bridge maintenance operations
907	Flooding
1494	Evacuation
1706	Emergency vehicles
2048	Off Ramp Backup
2049	Police Activity
2074	Weather Event
2081	Abandoned vehicle
2082	Road work - emergency

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2083	Road work - scheduled
2084	Unknown event
2085	Interagency coordination
2096	Weather event due to rain
2097	Weather event due to fog
2098	Weather event due to flooding
2099	Special Event
EVENT_ELEMENT_DESCRIPTION_IDX is used to determine the order events should be played in.	

2. PRIMARY_LINEAR_REFERENCE (optional)		
The offset distance. It is signed and provided in miles.		
condition	**value**	**prompt**
if linear reference is zero, ignore linear reference	"-"	before
if linear reference is non-zero, override "before", "beyond" in OFFSETTYPE	"+"	beyond

3. NEAREST_XSTREET_OFFSETTYPE	
the offset of the primary reference location	
value	**prompt**
"rampFrom"	ramp from
"rampTo"	ramp to
"at"	at
"before"	before
"beyond"	beyond

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4. PRIMARY_XSTREET_DESIGNATOR
the reference location (street name) for the incident

5a. EXIT_NUMBER (optional)			5b. EXIT_SUFFIX (optional)
append if available			append if available
value	**prompt**		**value / prompt**
<exit #>	exit <#>		A
			B
			C
			D

6. On Ramp (Optional)			7. Off Ramp (Optional)	
SAE Message code group 2			SAE Message code group 3	
EM Code	**prompt**		**EM Code**	**prompt**
406	On-ramp closed		407	Off-ramp closed

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2070	On-ramp right lane blocked		2067	Off-ramp right lane blocked
2071	On-ramp left lane blocked		2068	Off-ramp left lane blocked
2072	On-ramp center lane blocked		2069	Off-ramp center lane blocked

8. Lane Closure (Optional)				**9. Connecting Phraseology (Optional)**
SAE Code Group 4				
EM Code	**Optional Qualifier**	**prompt**		
482		Express lanes closed		
507		Right lane blocked		
508		Center lane blocked		and it's backed up until
509		Left lane blocked		
2050		Right shoulder blocked		
2051		Left shoulder blocked		
2077		Right express lane blocked		
2078		Left express lane blocked		
2079		Express lane left shoulder blocked		
2080		Express lane right shoulder blocked		
2089		Center express lane blocked		
2100	X	Right lanes blocked		
2101	X	Left lanes blocked		
2102	X	Center lanes blocked		
2103		All lanes blocked		
Note: Optional Qualifier "X" can be an integer from 2-6.				

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10. SECONDARY_LINEAR_REFERENCE (Optional)	
if there is congestion, this is the offset distance. It is signed and provided in miles.	
value	**prompt**
"0"	(NO PROMPT)
"-"	before
"+"	beyond

11. SECONDARY_XSTREET_DESIGNATOR (Optional)		12. Connecting Phraseology (Optional)
the congestion location		
		Suggested Alternate Road

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13.ALTERNATE_ROUTE_DESCRIPTION (Optional)		11. Connecting Phraseology		12 Read-out Event Time Stamp
		Last updated		

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4 Glossary

- **ASP.NET** - is a set of web application development technologies marketed by Microsoft. Programmers can use it to build dynamic web sites, web applications and XML web services. It is part of Microsoft's .NET platform and is the successor to Microsoft's Active Server Pages (ASP) technology. ASP.NET is built on the Common Language Runtime, meaning programmers can write ASP.NET code using any Microsoft .NET language.
- **C#** - is an object-oriented programming language developed by Microsoft as part of their .NET initiative, and later approved as a standard by ECMA and ISO. C# has a procedural, object-oriented syntax based on C++ that includes aspects of several other programming languages (most notably Delphi and Java) with a particular emphasis on simplification (fewer symbolic requirements than C++, fewer decorative requirements than Java).
- **Cascading Style Sheets (CSS)** - a stylesheet language used to describe the presentation of a document written in a mark-up language. Its most common application is to style web pages written in HTML and XHTML, but the language can be applied to any kind of XML document, including SVG and XUL. The CSS specifications are maintained by the World Wide Web Consortium (W3C).
- **Application / Data Access Layer (DAL)** - is a layer of a computer program which provides simplified access to data stored in persistent storage of some kind, such as an entity-relational database. This Application / Data Access Layer is used in turn by other program modules to access and manipulate the data within the data store without having to deal with the complexities inherent in this access. For example, the DAL might return a reference to an object (in terms of object-oriented programming) complete with its attributes instead of a row of fields from a database table. This allows the client (or using) modules to be created with a higher level of abstraction. This kind of model could be implemented by creating a class of data access methods which directly reference a corresponding set of database stored procedures.
- **HyperText Mark-up Language (HTML)** - is the predominant mark-up language for the creation of web pages. It provides a means to describe the structure of text-based information in a document — by denoting certain text as headings, paragraphs, lists, and so on — and to supplement that text with interactive forms, embedded images, and other objects. HTML can also describe, to some degree, the appearance and semantics of a document, and can include embedded scripting language code which can affect the behaviour of web browsers and other HTML processors.
- **Mapping Component –** an application that serves mapping based or spatial queries.

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